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Battelle Technical Review

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Pesticide Research and Control

PLASTICS TECHNOLOGIST

ROBERT LEININGER

Because of the importance of plastics in our lives, it might be said that we live in the "Age of Plastics". Robert Leininger believes, as do others, that the use of plastics will continue to expand far beyond their present horizons. He believes that plastics are highly suitable for many uses beyond their usual ones. For example, he believes that plastics will find many uses for structural purposes, such as wall panels, skylights, and external finishes, and are certain to be used more widely for such products as pipe and automobile bodies.

Bob's career was wedded to plastics during his graduate school days when he began his first intensive work in the field. Since his association with Battelle in 1948, he has undertaken a wide range of studies to help extend the usefulness of plastics. After investigating the use of nylon and Fiberglas in laminates for body armor, he worked on problems related to plastic sponges and floor coverings, the polymerization and copolymerization of vinyl chloride, and the development of artificial weathering techniques for nylon and plastics. At present, Bob is directing a study to determine the service characteristics of plastic pipe. Before joining Battelle, he was a research chemist with the Monsanto Chemical Company, Springfield, Massachusetts.

While a student at Fenn College in Cleveland, Ohio, Bob chose chemical over civil engineering and received his bachelor's degree in 1940. At Western Reserve University he received the master's degree the next year, and the Ph.D. degree in chemistry in 1943.

Now, as assistant chief in Battelle's Resin and Rubber Division, Bob has administrative as well as research responsibilities. He is a member of the American Chemical Society and Sigma Xi and has just been appointed to serve as Battelle's voting representative for the Society of the Plastics Industry.

Away from the Institute, Bob divides his time between his three children and the new house which he recently purchased.

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***Asterisks mark items that may be used in the Battelle Library only. None of the unbound materials listed below are available for interlibrary loan.**

AERONAUTICAL ENGINEERING

1432* High Maximum Lift. G. H. Lee. *Aeroplane*, v. 85, Oct. 30, 1953, p. 603-608.

Discusses problems of reducing stalling and approach speed of aircraft and of obtaining high maximum lift. Graphs, diagrams. (To be concluded.)

1433* Structural Aspects of Swept-Back Wings. B. R. Noton. *Aircraft Engineering*, v. 25, Nov. 1953, p. 330-343.

Account of research work in Sweden, with particular reference to model tests. Photographs, diagrams, graphs.

1434 Structures for High Speed Aircraft. Hall L. Hibbard and J. F. McBrearty. *Aviation Age*, v. 2, Nov. 1953, p. 32, 34, 37-51.

Discusses effects of high skin temperatures on design of missiles. Describes trends in material properties and flight test measurements on high speed aircraft. Graphs, photographs, diagrams. 6 ref.

1435 Control System Requirements for Ramjet Missiles. James C. Wise. *Aviation Age*, v. 2, Nov. 1953, p. 64-70.

Includes graphs.

1436 New Planes Need More Titanium. *Aviation Week*, v. 53, Nov. 23, 1953, p. 22.

Discusses effect on future design requirements in aircraft industry if light metal output should fail.

1437 Waffles Stiffen Highspeed Structures. Irving Stone. *Aviation Week*, v. 53, Nov. 23, 1953, p. 38, 40, 43.

Describes makeup of waffle-type integrally stiffened panels used in tests on high-speed air craft. Photographs, graphs.

1437a A Simplified Theory of Swept Wing Deformation. A. H. Hall. *Canadian National Aeronautical Establishment Report* 19, 1953, 21 p. (TL523 C16.5r)

A simplified theory is presented for determination of displacements along the locus of section shear centers within the root triangle of a swept wing. Formulae are derived which permit straightforward calculation of the outboard influence coefficients for any loading condition. Graphs, photographs, tables. 2 ref.

1438* Some Basic Concepts for Analyzing Dynamic Flight-Test Data. H. Klein and R. Sedney. *Journal of the Aeronautical Sciences*, v. 20, Nov. 1953, p. 740-748.

Considers theoretical aspects of flight-testing problem exclusively from the point of view of obtaining coefficients of differential equation. Tables, diagram. 6 ref.

1439 Fifty Years of Powered Flight. Ben Lockspeiser. *Nature*, v. 172, Oct. 24, 1953, p. 742-746.

A review and discussion of problems in aircraft design. Graphs.

1440* Bending Moments in Fuselage Frames Obtained by the Photoelastic Method. P. P. Benham. *Royal Aeronautical Society, Journal*, v. 57, Nov. 1953, p. 667-682.

Presents results of series of tests made by the photoelastic method on models with and without supporting shells. Photographs, tables, diagrams, graphs. 9 ref.

1441* Types of Flow on Swept Wings. With Special Reference to Free Boundaries and Vortex Sheets. D. Küchemann. *Royal Aeronautical Society, Journal*, v. 57, Nov. 1953, p. 683-699.

Presents an examination of various types of the above when the air stream is not attached to the wing surface everywhere. Discusses behavior of vortex sheets which arise from such mixed flows. Diagrams, graphs. 16 ref.

1442 The Langley Annular Transonic Tunnel. Louis W. Habel, James H. Henderson, and Mason F. Miller. *U. S. National Advisory Committee for Aeronautics, Report* 1106, 1952, 10 p. (TL521 Un3r)

Describes the development and gives an approximate evaluation of results obtained with this facility by comparison with data from other sources. Graphs, diagrams, photographs. 11 ref.

1443 Factors Affecting Transition At Supersonic Speeds. K. R. Czarnecki and Archibald R. Sinclair. *U. S. National Advisory Committee for Aeronautics, Research Memorandum* L53I18a, Nov. 4, 1953, 13 p. (TL782 Un3rm)

Variables studied include Mach number, Reynolds number, pressure gradients, heat transfer, surface roughness, and angle of attack. Discussion is limited to bodies of revolution. Graphs. 10 ref.

1444 A New Simple Interferometer for Obtaining Quantitatively Evaluable Flow Patterns. S. F. Erdmann. *U. S. National Advisory Committee for Aeronautics, Technical Memorandum* 1363, Nov. 1953, 62 p. (TL570 Un3tm) (Translated from *Applied Scientific Research*, v. 2, sec. B, 1952.)

Method make it possible to obtain interferometer records with the aid of any one of the available schlieren optics by addition of very simple expedients. Photographs, micrographs, diagrams, graphs. 7 ref.

1445 Design of Two-Dimensional Channels With Prescribed Velocity Distributions Along the Channel Walls. John D. Stanitz. *U. S. National Advisory Committee for Aeronautics, Report* 1115, 1953, 40 p. (TL521 Un3r)

Method is developed for compressible and incompressible, irrotational, and nonviscous flow. Applies to the design of elbows, diffusers, and nozzles. Tables, graphs. 11 ref.

See also:

1948 (analog computers in aircraft control)
2037 (cost of airplanes)
2178 (telemetry for guided missiles)
2189 (pressures indicator for aerodynamic problems)
2191 (aircraft instrumentation)

AGRICULTURE

1446* Herty Fluidity of Lead Reduction Slags. (Portuguese.) Tharcisio D. de Souza Santos. *ABM (Boletim da associacao brasileira de metais)*, v. 9, no. 31, Apr. 1953, p. 261-289.

Discusses experimental investigation on 97 different compositions. Tables, graphs. 7 ref.

Agriculture

1447* Surfactants in Fertilizer. Vincent Sauchelli. *Agricultural Chemicals*, v. 8, Nov. 1953, p. 32-34, 143, 145, 147.

Defines "Surfactants" and discusses claim made for them by suppliers. Discusses tests made by fertilizer manufacturers in various parts of the country.

1448* Persistence of CMU in Soil. A. J. Loustalot, T. J. Muzik, and H. J. Cruzado. *Agricultural Chemicals*, v. 8, Nov. 1953, p. 52-53, 97-99, 101.

A study of experiments with the herbicide CMU, show material to be potent, non-selective, and capable of controlling most weeds when applied at relatively low rates. Photographs. 8 ref.

1449* State Fertilizer Control Laws. John D. Conner. *Agricultural Chemicals*, v. 8, Nov. 1953, p. 59-60, 123, 125.

Discusses revisions of state fertilizer control laws of 8 states during 1953 legislative season.

1450* Lethal Effect of Electrons on Insects Infesting Wheat and Flour. I. V. H. Baker, Oscar Taboada, and D. E. Wiant. *Agricultural Engineering*, v. 34, Nov. 1953, p. 755-758.

Reports on a portion of an investigation on lethal effects of electromagnetic energy and subatomic particles on certain insects. Graphs, photographs, diagram. 11 ref.

1451* Flow Patterns of Air Through Grain During Drying. Tappan Collins. *Agricultural Engineering*, v. 34, Nov. 1953, p. 759-760, 768.

Describes Quonset 16 grain dryer manufactured for use in research. Its purpose was to obtain fundamental information useful in design and farm operation aeration of drying units.

1452* Some Histological and Morphological Effects of Maleic Hydrazide on a Spring Wheat. A. R. Hoagland, F. C. Elliott, and L. W. Rasmussen. *Agronomy Journal*, v. 45, Oct. 1953, p. 468-472.

Objectives of this study were to determine the action of maleic hydrazide on tissue differentiation and its effects on subsequent development and yield of spring wheat. Tables, photographs. 8 ref.

1453* Sulphur Nutrition in Flue-Cured Tobacco. Ivan Neas. *Agronomy Journal*, v. 45, Oct. 1953, p. 472-477.

Discusses experimental results of an experiment initiated in 1947 in Cook County, Ga., using Norfolk sandy loam soil. Tables. 18 ref.

1454 Modification of Floral Initiation With Auxins and Temperatures. A. C. Leopold and Frances S. Guernsey. *American Journal of Botany*, v. 40, Oct. 1953, p. 603-607.

Treatment of seeds with naphthaleneacetic acid solutions followed by a brief exposure to low temperature (3 C.) was shown to be promotive of flowering in Wintex barley, teosinte, Biloxi soybean, Victory oats, and Sun-up corn. Graphs. 21 ref.

1455 The Flax Industry Looks to the Future. E. H. Russell. *American Paint Journal*, v. 38, Nov. 23, 1953, p. 34, 36.

Address presented at the Meeting of the Flax Institute of the U. S. Discusses depletion of soil fertility and methods of conservation.

1456* Urethanes and Soil Nitrification. J. H. Quastel and P. G. Scholefield. *Applied Microbiology*, v. 1, Nov. 1953, p. 282-287.

Investigates inhibitive effects of a series of urethanes on nitrification of ammonium ions in fresh soil. Tables, graphs. 16 ref.

1457* Toxicity of Malathon. Lloyd W. Hazleton and Emily G. Holland. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Nov. 1953, p. 399-405.

Summary of results of toxicological studies on the insecticide Malathon.

1458* Absence of Toxic Manifestations in Workers Exposed to Chlordane. Walter C. Alvarez and Samuel Hyman. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Nov. 1953, p. 480-491.

Tests on 24 persons daily exposed to chlordane during it manufacture indicate that when it is breathed or placed in contact with the skin it is harmless. Table.

1459* The Importance of Trace Elements in Crop Nutrition. E. J. Hewitt. *British Agricultural Bulletin*, v. 6, Nov.-Dec., 1953, p. 222-229.

Discusses essential elements, trace-element disorders, availability of trace elements, and control measures. Photographs.

1460* Developmental Stages of the Cotton Plant as Related to the Effects of 2,4-D. Wayne J. McIlrath and David R. Ergle. *Botannical Gazette*, v. 114, June 1953, p. 461-467.

Results of tests have shown that cotton plants in the seedling stages are much more sensitive to minute quantities of 2,4-D than those at later development stages. Table, diagrams, photographs. 7 ref.

1461 Oil Seed Production in Canada. J. C. Woodward. *Chemistry in Canada*, v. 5, Nov. 1953, p. 241-243.

Discusses reasons for the importance of oil seed production to both agriculture and industry.

1462 Phytohormones and Growth-Regulating Compounds. Hubert Martin. *Chemistry in Canada*, v. 5, Nov. 1953, p. 244-247.

Reviews the field of phytohormones. Mentions use for weed control, induced formation of seedless fruit, and arresting of growth.

1463 Insect Population Balance and Chemical Control of Pests. M. E. Solomon. *Chemistry & Industry*, 1953, no. 43, Oct. 24, p. 1143-1147.

Discusses ecological unbalance caused by indiscriminate use of insecticides. Diagram. 54 ref.

1464* The Use of Antibiotics in the Control of Plant Disease. *Chemurgic Digest*, v. 12, Oct. 1953, p. 9-11, 18-19.

Reports the successful application of terramycin and streptomycin to control of halo blight of beans and fireblight. Photographs.

1465* 2,4-D Spraying Program Keeps Wild Garlic Down, Won't Eradicate the Weed Entirely. *Crops & Soils*, v. 6, Nov. 1953, p. 22.

Necessity for repeated applications, effects on desirable pasture plants, and directions for spraying are presented.

1466* Plant Hormones. S. C. Harland. *Discovery*, v. 14, Nov. 1953, p. 350-354.

Discusses types of hormones and their effects on growth of roots, leaves, and stems. Photographs.

1467* A New Link in the Nourishment System of Grasses in Connection With the Problem of Regulating the Microbial Composition in the Rhizosphere of Cultivated Plants. (Russian.) E. I. Ratner, T. A. Akimochkina, and S. A. Samoilova. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 421-424.

Neutralized industrial superphosphate equivalent to 10 kg. of P_2O_5 per hectare was broadcast along with the seed. Nitrogen fixing bacteria were stimulated. Tables. 10 ref.

1468* Some Aspects of the Biology of Armoured Scale Insects. F. Baranyovits. *Endeavour*, v. 12, Oct. 1953, p. 202-209.

Describes life history of these insects so far as is known and difficulties in their control. Photographs, diagrams. 8 ref.

1469 British Use Dorreo Process for Granulated Triple Super. J. J. Porter and J. Frisken. *Farm Chemicals*, v. 116, Nov. 1953, p. 38-39, 43-46, 70.

Describes a unique process for manufacture of granulated triple super-phosphate. Photographs, diagrams.

1470* Symposium on Scientific Problems of the Sugar Industry. *Indian Academy of Sciences, Proceedings*, v. 38, sec. B, Aug. 1953, p. 49-100.

Includes "Some Scientific Problems of the Sugar Industry", S. N. Gundu Rao; "Scientific Problems of the Sugar Industry",

Ram Behari Lal Mathur; "The Electrical Coagulation of Cane-Juice Colloids and a New Sugar Technology", Dhirendra Nath Ghosh; "The Breeding of Sugarcane", N. L. Dutt; "Varietal Problem With Special Reference to Its Physiological and Biochemical Aspects", K. L. Khanna; "An Agro-Botanical Problem Affecting the Sugarcane Industry in India", R. R. Panje; "Some Aspects of Sugarcane Breeding in Relation to Its Cyto-Genetical Peculiarities", T. S. Raghavan; and "Pathogenicity, Spread and Reversion of *Physalospora tucumenensis* 'D' Rafay", S. A. Rafay.

1471* Anhydrous Ammonia Is a Leader in Growing Fertilizer Developments. *Journal of Agricultural and Food Chemistry,* v. 1, Nov. 11, 1953, p. 1040-1042.

Describes direct-application of ammonia as one of the most important developments in the fertilizer field today. Photographs.

1472* Enthusiasm for Surfactants in Fertilizer Mixing Wanes. *Journal of Agricultural and Food Chemistry,* v. 1, Nov. 11, p. 1044.

Brief summary of facts which have caused original enthusiasm over surfactants to subside.

1473* Nitric Phosphates From Phosphate Rock, Nitric Acid, Ammonia, and Carbon Dioxide. F. T. Nielsson, L. D. Yates, L. F. Roy, and F. G. Heil. *Journal of Agricultural and Food Chemistry,* v. 1, Nov. 11, 1953, p. 1050-1054.

Outlines process used for making nitric phosphate fertilizers from the above. Tables, diagram. 9 ref.

1474* Economics of the Nitric Phosphate Fertilizer Processes. Z. A. Stanfield. *Journal of Agricultural and Food Chemistry,* v. 1, Nov. 11, 1953, p. 1054-1059.

Evaluates the above under current market conditions based on results of TVA pilot plant work. Tables, diagram. 9 ref.

1475* Factors Influencing Protein Synthesis by Microorganisms in Vitro. Donald B. Hudman, H. O. Kunkel, and Betty J. Hood. *Journal of Agricultural and Food Chemistry,* v. 1, Nov. 1953, p. 1060-1062.

Describes vitro method of studying rumen microorganisms. Tables. 5 ref.

1476* Enzyme Systems of the White Potato. Sigmund Schwimmer. *Journal of Agricultural and Food Chemistry,* v. 1, Nov. 11, 1953, p. 1063-1069.

Describes usefulness of the white potato and its enzymes in the field of enzyme chemistry. Diagrams, table. 110 ref.

1477* Control of Starter Preparation in Fermentation of Molasses. Walter Borzani and Miguel Falcone. *Journal of Agricultural and Food Chemistry,* v. 1, Nov. 11, 1953, p. 1070-1071.

Discusses steps necessary to control alcoholic fermentation of molasses. Equations and nomograms are presented. Tables and graphs.

1478* The Lateral-Terminal Elongation Growth Ratio of Red Pine as an Index of Saratoga Spittlebug Injury. Daniel M. Benjamin, Harold O. Batzer, and Herbert G. Ewan. *Journal of Forestry,* v. 51, Nov. 1953, p. 822-823.

A method for evaluating subclinical or subeconomic damage caused by forest insects, particularly the Saratoga Spittlebug, is presented. Tables, graphs.

1479* Zinc Deficiency of Fruit Trees in Great Britain. C. Bould, D. J. D. Nicholas, J. A. H. Tolhurst, and J. M. S. Potter. *Journal of Horticultural Science,* v. 28, Oct. 1953, p. 260-267.

Zinc deficiency symptoms are indicated. Recommended treatment presented. Photographs, tables. 18 ref.

1480* Copper Deficiency of Fruit Trees in Great Britain. C. Bould, D. J. D. Nicholas, J. A. H. Tolhurst, and J. M. S. Potter. *Journal of Horticultural Science,* v. 28, Oct. 1953, p. 268-277 + 4 plates.

Copper deficiency symptoms in apple trees are described and treatments recommended. Tables, photographs. 17 ref.

1481* The Amino Acid and Protein Content of Corn as Related to Variety and Nitrogen Fertilization. H. E. Sauberlich, Wan-Yuin Chang, and W. D. Salmon. *Journal of Nutrition,* v. 51, Oct. 1953, p. 241-250.

Determinations were made for protein and for 18 amino acids on a series of corn samples. Results revealed that rate of nitrogen fertilization employed and variety selected influenced considerably protein and amino acid contents of the corn kernel. Graphs, tables. 18 ref.

1482* Fumigation of Agricultural Products. V. The Distribution of Nicotine Vapour in Glasshouses. VI. Penetration and Sorption of Hydrogen Cyanide in Wheat Fumigated at Reduced Pressures. A. K. M. El Nahal. *Journal of the Science of Food and Agriculture,* v. 4, Nov. 1953, p. 512-522.

Includes tables, graphs. 21 ref.

1483* Chemical Examination of Celery Seeds. M. O. Farooq, S. R. Gupta, M. Kiamuddin, W. Rahman, and T. R. Seshadri. *Journal of Scientific & Industrial Research,* v. 12, sec. A, Sept. 1953, p. 400-407.

Describes analytical procedures and results. 22 ref.

1484* Economic Poisons. *Manufacturing Chemist,* v. 24, Nov. 1953, p. 482-484.

Presents a review of 1953 literature. Includes studies of insect toxicity and animal non-toxicity. Photograph. 16 ref.

1485 Control of Multi-Resistant Houseflies. H. Wichmand. *Nature,* v. 172, Oct. 24, 1953, p. 758-759.

Describes use of Parathion treated gauze strips hung in infested areas.

1486* The Cabbage Root Aphid. George P. Wene and A. N. White. *Ohio Journal of Science,* v. 53, Nov. 1953, p. 332-334.

Describes attempts to control aphid infestation of cabbage fields by use of insecticides in irrigation water. 4 ref.

1487* The Water Economy of Fusarium Wilted Tomato Plants. A. E. Diamond and Paul E. Waggoner. *Phytopathology,* v. 43, Nov. 1953, p. 619-623.

Reports experimental study. Velocity of transpiration stream was measured by means of radiophosphate movement in diseased and healthy cuttings.

1488* Possibility of a Toxic Reaction From Heavy Water on Agricultural Plants. (Russian.) Iu. A. Poliakov. *Pochvovedenie,* 1953, no. 7, July, p. 25-32.

Heavy water shows a negative influence on growth and development of plants when its concentration reaches 30-40% in the food medium. Tables, graphs. 9 ref.

1489* Phosphorus Fixation by Certain Clay Minerals Dependent on Size of Particles and Time of Interaction With a Phosphate Solution. (Russian.) K. E. Ginzburg. *Pochvovedenie,* 1953, no. 7, July, p. 43-51.

A study was made on the relative abilities of kaolin, mica, and other minerals to fix phosphates in a form not readily accessible to plants. Diagrams, tables. 15 ref.

1490* Agricultural Values of Sewage. Bernard P. Skulte. *Sewage and Industrial Wastes,* v. 25, Nov. 1953, p. 1297-1303.

Include photographs, tables. 10 ref.

1491* Influence of Accumulated Soil on Bacterial Population of Milking Machines. W. L. Mallmann, Frank Peabody, and Don Muentener. *Soap and Sanitary Chemicals,* v. 29, Nov. 1953, p. 132-133, 137, 139.

Summarizes results of a study on various sanitizing processes. Tables. 4 ref.

1492* Radioactive Tracers in Insecticide Research. III. Paul A. Dahm. *Soap and Sanitary Chemicals,* v. 29, Nov. 1953, p. 141, 143, 145, 147, 165.

Review of experimental work. 20 ref. (To be continued.)

1493* Mechanisms Responsible for Retention of Manganese in the Colloidal Fraction of Soil. Glen A. Hemstock and Philip F. Low. *Soil Science,* v. 76, Nov. 1953, p. 331-343.

Graphs, tables. 27 ref.

Agriculture

1494 Chemical Factors in Cation Exchange Between Root Surfaces and Nutrient Media. C. E. Marshall and W. J. Upchurch. *Soil Science Society of America Proceedings*, v. 17, July 1953, p. 222-227.

Experiments were designed to throw light on two main factors in cation uptake; cationic activity of the nutrient medium and mean free energy change of the reaction in which nutrient ions are exchanged for hydrogen ions. The third factor; activity of the hydrogen ions was not fully investigated. Tables. 24 ref.

1495 Factors Affecting Adsorption of Cations by Plant Roots. A. Mehlich. *Soil Science Society of America Proceedings*, v. 17, July 1953, p. 231-234.

Adsorption of Ca, Mg, K, and Na by metabolically inactive H-roots of wheat and alfalfa in relation to the nature of the anion were studied. It is concluded that the adsorption of cations by metabolically inactive roots is a neutralization reaction involving Ca. Tables, graph. 24 ref.

1496* Potassium Competition in Grass-Legume Associations as a Function of Root Cation Exchange Capacity. Bryce Gray, Mack Drake, and Wm. G. Colby. *Soil Science Society of America Proceedings*, v. 17, July 1953, p. 235-239.

Ladino clover, smooth brome grass, Kentucky bluegrass, and bentgrass were grown in greenhouse pots to determine relative uptake of K by the species when grown separately; and to study competition for K when ladino clover was grown in association with each of the three grasses. Tables. 9 ref.

1497* X-ray Characteristics of Clay Minerals As Related to Potassium Fixation. G. W. Kunze and C. D. Jeffries. *Soil Science Society of America Proceedings*, v. 17, July 1953, p. 242-244.

Evidence is presented to support early K fixation theories based on entrapment of the K ion due to closure of interlayer spaces. Graphs. 11 ref.

1498* Nitrogen Status of Marshall Silt Loam as Influenced by Different Crop Rotations. R. M. Andharia, G. Stanford, and F. W. Schaller. *Soil Science Society of America Proceedings*, v. 17, July 1953, p. 247-251.

Value of studying leaf nitrogen as well as nitrification rate as a means of periodically evaluating the soil nitrogen status in rotational experiments is discussed. Photographs, tables, graphs. 8 ref.

1499* Nitrogen, Phosphorus, and Potassium Content of the Corn Leaf and Grain as Related to Nitrogen Fertilization and Yield. William F. Bennett, George Stanford, and Lloyd Dumenil. *Soil Science Society of America Proceedings*, v. 17, July 1953, p. 252-258.

Experiments prove leaf analysis provides a clearer indication of the nutrient status of the plants than did grain analysis for all three nutrients. Tables, graphs. 14 ref.

1500* Correlation of Soil Tests for Available Phosphorus and Potassium With Crop Yield Responses to Fertilization. O. H. Long and L. F. Seatz. *Soil Science Society of America Proceedings*, v. 17, July 1953, p. 258-262.

Separate yield responses to applied P and K were correlated with soil tests for these elements on experiments with corn, cotton, small grains, legume hays, and permanent pastures. Sodium perchlorate in N/10 perchloric acid was the extracting agent. Results are presented in graphic form. Graphs. 13 ref.

1501* Residual Effect of Phosphorus on Cotton Grown on Cecil Soil as Determined With Radioactive Phosphorus. Matthias Stelly and H. D. Morris. *Soil Science Society of America Proceedings*, v. 17, July 1953, p. 267-269.

Discusses residual effect on cotton of superphosphate applied two years earlier at different rates and by different methods on limed and unlimed soil. Tables. 11 ref.

1502* The Behavior of Applied Phosphorus and Poatssium in Organic Soils as Indicated by Soil Tests and the Relationship Between Soil Tests, Green-Tissue Tests and Crop Yields. T. C. Bigger, J. F. Davis, and Kirk Lawton. *Soil Science Society of America Proceedings*, v. 17, July 1953, p. 279-283.

Periodic green-tissue tests of sugar beets and peppermint revealed a seasonal variation in the composition of water extractable P and K in these plants. 8 ref.

1503* From the Field of Organic Insectofungicides. XIV. Synthesis of Certain Mixed Esters of Dithio Phosphoric Acid. N. N. Mel'nikov and K. D. Shvetsova-Shilovskaia. **XV. Synthesis of Certain Esters of Thio Phosphoric Acid Containing Various Substitutes in the Aromatic Radical.** (Russian.) N. N. Mel'nikov and D. N. Khokhlov. *Zhurnal Obshchei Khimii*, v. 23, no. 8, Aug. 1953, p. 1352-1364.

Includes tables. 25 ref.

See also:

1623 (determination of Cu in plant material)
1672 (determination of As in soils)
1995 (economics in agronomy)
2004 (fertilizers and farm costs)
2066 (yeast production from agricultural wastes)
2614 (phenolic foam resins for soilless culture)

BIOCHEMICAL AND BIOPHYSICAL RESEARCH

1504 The Kinetics of Protein Denaturation. I. The Behavior of the Optical Rotation of Ovalbumin in Urea Solutions. Richard B. Simpson and W. Kauzmann. **II. The Optical Rotation of Ovalbumin in Solutions of Guanidinium Salts.** J. Schellman, R. B. Simpson, and W. Kauzmann. **III. The Optical Rotations of Serum Albumin, β-Lactoglobulin and Pepsin in Urea Solutions.** W. Kauzman and R. B. Simpson. **IV. The Viscosity and Gelation of Urea Solutions of Ovalbumin.** H. K. Frensdorff, M. T. Watson, and W. Kauzmann. **V. The Viscosity of Urea Solutions of Serum Albumin.** H. K. Frensdorff, M. T. Watson, and W. Kauzmann. *American Chemical Society, Journal*, v. 75, Nov. 5, 1953, p. 5139-5172.

Includes graphs, tables. 160 ref.

1505 Role of Nutrition in the Maintenance of the Yeast-Shape in Candida. Walter J. Nickerson and Zbigniew Mankowski. *American Journal of Botany*, v. 40, Oct. 1953, p. 584-592.

Includes micrographs, tables. 25 ref.

1506* Humidity Requirements for Mold Growth. S. S. Block. *Applied Microbiology*, v. 1, Nov. 1953, p. 287-293.

From experiments described here atmosphere of 65% R.H. or less, might be considered safe for permanent storage of all materials. Tables, graphs. 13 ref.

1507* Studies in Detoxication. LI. The Determination of Catechols in Urine, and the Formation of Catechols in Rabbits Receiving Halogenobenzenes and Other Compounds. Dihydroxylation *in Vivo*. W. M. Azouz, D. V. Parke, and R. T. Williams. **LII. The Apparent Dissociation Constants of Some Glucuronides, Mercapturic Acids and Related Compounds.** D. Robinson, J. N. Smith, and R. T. Williams. **LIII. The Glucuronic Acid Conjugation of Hydroxyquinolines and Hydroxypyridines in the Rabbit.** J. N. Smith. *Biochemical Journal*, v. 55, Aug. 1953, p. 146-160.

Includes tables, graphs. 74 ref.

1508* Preparation of ^{32}P-Labelled Adenosine Triphosphate. R. Hems and W. Bartley. *Biochemical Journal*, v. 55, Oct. 1953, p. 434-435.

Presents simple laboratory method. 8 ref.

1509* The In-Vitro Sensitivity of *H. Influenzae* to Five Different Antibiotics. K. Zinnemann. *British Medical Journal*, 1953, Nov., p. 1069-1072.

Tests were made using penicillin, streptomycin, aureomycin, chloramphenicol, and terramycin. Tables. 29 ref.

1510 Production of Organic Acids by Molds. S. M. Martin. *Canadian Chemical Processing*, v. 37, Oct. 1953, p. 30, 32-34, 36, 38.

Discusses importance of citric, gallic, gluconic, itaconic, and kojic acid production. Photographs.

1511 Bacterial Fermentation. F. J. Simpson. *Canadian Chemical Processing*, v. 37, Oct. 1953, p. 78, 80, 82, 84, 86.

Discusses bacterial fermentation of lactic acid, vinegar, cobalamins, and methane. Tables, photographs. 9 ref.

1512 A Slide Technique for the Study of Fungi and Actinomycetes in Soil With Special Reference to *Helminthosporium Sativum*. S. H. F. Chinn. *Canadian Journal of Botany*, v. 31, Nov. 1953, p. 718-724 +3 plates.

Describes slide technique for studying behavior of fungi and actinomycetes, both qualitatively and quantitatively in soils. Tables. 3 ref.

1513 Bacteriophage in Relation to Xanthomonas Translucens. H. Katznelson and M. D. Sutton. *Canadian Journal of Botnay*, v. 31, Nov. 1953, p. 725-729.

Reports on results of extensive tests. Tables. 5 ref.

1514* Studies of *Aspergillus Niger*. I. The Structure of the Polyglucosan Synthesised by *Aspergillus Niger* 152. S. A. Barker, E. J. Bourne, and M. Stacey. *Chemical Society, Journal*, 1953, Oct., p. 3084-3090.

Includes diagrams, tables.

1515 The Antibiotic Nisin and Its Use in the Making and Processing of Cheese. N. J. Berridge. *Chemistry & Industry*, 1953, no. 44, Oct. 31, p. 1158-1161.

Includes graphs, tables. 18 ref.

1516* The Biological Importance of Organic Compounds of Sulphur. Frederick Challenger. *Endeavour*, v. 12, Oct. 1953, p. 173-181.

A systematic review with discussion of associated amino acids. 37 ref.

1517* Hormones of the Adrenal Cortex and ACTH. F. G. Young. *Export Review*, v. 14, Nov. 1953, p. 35-40.

In spite of the accumulated mass of facts, little can be said about the influence of adrenal hormones in the general economy of the animal body. Photographs, diagrams. 9 ref.

1518 New Colloidal Silver Disinfectant. Effect of Environmental Factors on Bactericidal Action. Cecil W. Chambers, Leslie A. Chambers, and Paul Kabler. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2569-2571.

Movidyn was examined. At pH 8.5-9.0 and 22-25C. it is effective at 0.1 ppm. At pH 6.0-6.5 or lower temperature (2-5 C.), it is less effective. Tables.

1519 Bactericidal Action of Movidyn. Robert K. Hoffman, Bernard F. Surkiewicz, L. A. Chambers, and Charles R. Phillips. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2571-2573.

This colloidal Ag bactericide shows 99.99% kill at 1/20,000,000 dilution on test organisms in 12 hours. Movidyn is superior to $AgNO_3$ at equal dilution. Table, graphs, diagram.

1520* Biological Standardization of Essential Fatty Acids (A New Method). H. J. Thomasson. *International Review of Vitamin-Research*, v. 25, no. 1, 1953, p. 62-82.

Describes a method for determination of biological action of vitamin F. Tables, photograph.

1521* Effects of Some Salts on the Germicidal Action of High Voltage Cathode Rays Towards Micrococcus Pyogenes Var. Aureus. Cecil G. Dunn. *Journal of Bacteriology*, v. 66, Oct. 1953, p. 421-423.

Cadmium and cobalt chlorides in 0.5% concentration and cobalt and nickel chlorides and aluminum sulfate in 5.0% concentrations appeared to enhance germicidal action of cathode rays. Graphs.

1522* Metabolite Reversal of Antibiotic Inhibition, Especially Reversal of Aureomycin Inhibition by Riboflavin. J. W. Foster and Robert F. Pittillo. *Journal of Bacteriology*, v. 66, Oct. 1953, p. 478-486.

Describes experiments on 5 antibiotics in which reversal was tested with various metabolites. Tables. 14 ref.

1523 Role of Calcium and Related Ions in Proliferation of Lactic Streptococcus Bacteriophage. Norman N. Potter and F. E. Nelson. *Journal of Bacteriology*, v. 66, Nov. 1953, p. 508-516.

Includes graphs, tables. 17 ref.

1524* Pyridine Nucleotide Transhydrogenase. III. Animal Tissue Transhydrogenases. Nathan O. Kaplan, Sidney P. Colowick, and Elizabeth F. Neufield. **IV. Effect of Adenylic Acid a on the Bacterial Transhydrogenases.** Nathan O. Kaplan, Sidney P. Colowick, Elizabeth F. Neufield and Margaret M. Ciotti. **V. Exchange Reactions Studied with C^{14}.** Nathan O. Kaplan, Sidney P. Colowick, Leonard J. Zatman, and Margaret M. Ciotti. *Journal of Biological Chemistry*, v. 205, Nov. 1953, p. 1-43.

Includes graphs. 42 ref.

1525* The Mechanism of the Synthesis of Enzymes. II. Further Observations with Particular Reference to the Linear Nature of the Time Course of Enzyme Formation. C. J. Porter, R. Holmes, and Bruce F. Crocker. *Journal of General Physiology*, v. 37, Nov. 20, 1953, p. 271-289.

Includes graphs. 29 ref.

1526* Chemotherapy and Selective Toxicity. II. Metabolite Analogues and Enzyme Inhibition. J. L. Stoves. *Manufacturing Chemist*, v. 24, Nov. 1953, p. 472-474.

Discusses toxic agents which, because of chemical similarity to certain metabolites, can cause suppression of biological activity. Examples are given of drugs based on metabolite analogs. 14 ref.

1527* Isolation of the Antibiotic Tetain in Pure State. (Polish.) *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 503-509.

Describes method of isolating tetain. Presents main properties, Diagrams, graphs, photographs. 10 ref.

1528* Spectrophotometric Method of Determining Vitamin B_{12} in Cultures of Microorganisms. J. Janicki, J. Pawelkiewicz, St. Stawicki, and K. Zodrow. *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 509-511.

Modification of Rudkin and Taylor method of determining vitamin B_{12} in microbiological material has been worked out. Graphs, table. 7 ref.

1529* The Effects of Temperature on Ultraviolet-Induced Mutability in *Escherichia Coli*. Alexender M. M. Berrie. *National Academy of Sciences of the United States of America, Proceedings*, v. 39, Nov. 1953, p. 1125-1133.

Includes tables, graphs. 11 ref.

See also:

1463 (ecological unbalance caused by insecticides)
1621 (determination of Pb in biological materials)
1622 (determination of dihydrostreptomycin)
2160 (biochemical documentation)

CERAMICS AND CONCRETE

1530 Blending and Conveying of Ceramic Raw Materials by Fluidization. R. A. Koble, P. R. Jones, and W. A. Koehler. *American Ceramic Society, Bulletin*, v. 32, Nov. 1953, p. 367-372.

Includes graphs, tables.

1531 High Temperature Protection of a Titanium Carbide Cermet. John R. Wilson. *American Ceramic Society, Bulletin*, v. 32, Nov. 1953, p. 375-376.

Describes coating, containing Cr powder and high silica and baria frit, which protected Co-Ti carbide cermet against oxidation at 2200 F. Graphs, diagrams.

1532 Development of Open-Hearth Roof Refractories in Great Britain. James Mackenzie. *American Ceramic Society, Bulletin*, v. 32, Nov. 1953, p. 377-384.

Describes effect of flux content density of silica brick on performance in furnaces. Discusses silicrete and similar raw materials. Photographs, micrographs, tables.

1533 Effect of TiO_2, Fe_2O_3, and Alkali on Mineralogical and Physical Properties of Mullite-Type and Mullite-Forming Al_2O_3-SiO_2 Mixtures. I. Kenneth G. Skinner, W. How-

Ceramics and Concrete

ard Cook, Ralph A. Potter, and Hayne Palmour III. *American Ceramic Society, Journal*, v. 36, Nov. 1953, p. 349-356.

Preliminary tests indicated that the effects of TiO_2 might depend on the Al_2O_3-SiO_2 ratio. Therefore on Al_2O_3-SiO_2-TiO_2 sub-system was studied which indicated that 5% TiO_2 might be beneficial. Graphs. 4 ref.

1534 Thermal Conductivity of Refractory Insulating Concrete. W. C. Hansen and A. F. Livovich. *American Ceramic Society, Journal*, v. 36, Nov. 1953, p. 356-362.

Thermal conductivities and unit weights of 17 refractory insulating Lumnite cement concretes were determined over the range of 500 to 2000 F. Tables, graphs. 4 ref.

1535 Uranium Oxide Phase Equilibrium Systems. III. UO_2-ZrO_2. W. A. Lambertson and M. H. Mueller. *American Ceramic Society, Journal*, v. 36, Nov. 1953, p. 365-368.

The UO_2-ZrO_2 phase equilibrium system contained no new compounds but was found to contain extensive solid solution. Tables, graphs. 8 ref.

1536 Ferroelectric Properties of Lead Metaniobate. G. Goodman. *American Ceramic Society, Journal*, v. 36, Nov. 1953, p. 368-372.

In creamic form the material can be polarized to retain a piezoelectric constant of the same order of magnitude as that of barium titanate. Tables, diagrams, graphs. 9 ref.

1537 Effect of Heat-Treatment on Color of Amber Bottle Glass. William L. Spix and Frank R. Bacon. *American Ceramic Society, Journal*, v. 36, Nov. 1953, p. 377-383.

It was demonstrated that color and transmittance of carbon-sulfur amber glasses are affected reversibly by heat-treatment. Tables, graphs. 9 ref.

1538 Weight Loss and Oxidation Behavior of Structural Bodies During Firing. R. R. Van Der Beck and J. O. Everhart. *American Ceramic Society, Journal*, v. 36, Nov. 1953, p. 383-388.

Includes differential thermal analyses, oxidation-rate, and length-change determinations on 20 clay materials. Diagrams, graphs. 7 ref.

1539* Effect of Coarse-and Fine-Granular Clay Particles on the Results of Differential Thermoanalysis. (German.) P. W. Berg. *Berichte der deutschen keramischen Gessellschaft*, v. 30, no. 10, Oct. 1953, p. 231-235.

Research on grain size has shown no effect on analytical results. Discrepancies on results point to differences in composition. Tables, graphs, micrographs. 13 ref.

1540* Isomorphic Relationships in the In_2O_3-Y_2O_3-ZrO_2 System. (German.) C. Schusterius and N. N. Padurow. *Berichte der deutschen keramischen Gesellschaft*, v. 30, no. 10, Oct. 1953, p. 235-239.

Compositions were studied for possible use in high-temperature electric heating elements. X-ray data are presented. Tables, graphs. 12 ref.

1541* Determining the Amount of Beta Al_2O_3 in Fused Corundum. (German.) G. Jaeger. *Berichte der deutschen keramischen Gesellschaft*, v. 30, no. 10, Oct. 1953 ,p. 239-241.

Describes pycnometric, counting, and gravity methods of determining percentage of β Al_2O_3 as an impurity. Photographs, diagrams, tables.

1542 Determining the Fusion Points of Refractory Materials. *Brick & Clay Record*, v. 123, Nov. 1953, p. 83-84.

Presents definition of fusion point and outlines method of determining pyrometric cone equivalent values of refractory materials. Tables.

1543 Firing Clayware in Intermittent Kilns by Means of Underfed Stokers. J. W. Wright. *British Ceramic Society, Transactions*, v. 52, Oct. 1953, p. 513-522; disc., p. 523-527.

Discusses changeover of open-fired rectangular kilns firing fireclay refractories to underfeed stokers. Gives comparative coal consumption figures. Diagrams, graphs, table. 4 ref.

1544 The Organic Matter in Ball Clays. W. E. Worrall and C. V. Green. *British Ceramic Society, Transactions*, v. 52, Oct. 1953, p. 528-553.

Describes combustion method for determining total carbon. Discusses similarity of organic matter in ball clays to that in lignite. Reports convenient method of estimating various fractions. Tables, graphs. 14 ref.

1545 Chemical Notes on Chrome-Magnesite. J. F. Hyslop. *British Ceramic Society, Transactions*, v. 52, Oct. 1953, p. 554-560; disc., p. 560-564.

Discusses constitution, stability to reduction, iron oxide growth, and slagging. Tables, diagram. 13 ref.

1546 Some Factors Affecting the Crushing Strength of Porous Refractory Bodies. J. F. Clements and G. R. Rigby. *British Ceramic Soicety, Transactions*, v. 52, Oct. 1953, p. 565-577.

Discusses effects of consitiution, firing temperature, pore size, and water content. Tables. 3 ref.

1547 The Solubility of Lead Glazes. IV. Investigation of Certain Chemical Methods of Lead Determination. H. Bennett and F. Vaughn. *British Ceramic Society, Transactions*, v. 52, Oct. 1953, p. 578-587.

Various methods are outlined for determination of lead in solutions derived from attack of HCl on lead frits. Presents satisfactory chromate method, with gravimetric or volumetric finish. Discusses effects of contaminating ions. Tables. 1 ref.

1548 New Methods for Decorative Application of Metal to Glass and Ceramic Surfaces. Richard B. Belser. *Ceramic Age*, v. 62, sec. 1, Oct. 1953, p. 17-18, 20-21, 37.

Discusses application of molten indium to glass or ceramic surfaces and fractional application of metals to glass. Photographs, tables, micrographs.

1549 Effect of Quebracho Extract on Clays. Theodore White. *Ceramic Age*, v. 62, sec. 1, Oct. 1953, p. 31-34.

Discusses use of quebracho extract in ceramic field as a dispersant and as a viscosity, gel strength, and thixotropy reducer. Graphs. 21 ref.

1550 Weather Resistant Matte Finishes for Porcelain Enamel. Paul S. Cecil. *Ceramic Age*, v. 62, sec. 1, Oct. 1953, p. 38, 40.

Discusses various methods of manufacture. Presents advantages and disadvantages. Table.

1551 Pool Glazes. J. H. Saling. *Ceramics*, v. 1, Nov. 1953, p. 31, 36.

Discusses production of a thick sparkling pool of glass in the bottom of an ash tray, bowl, or other shallow pottery. Photographs.

1552 Prepared Lusters. Mary Pruden. *Ceramics*, v. 1, Nov. 1953, p. 33-34.

Discusses techniques of applying lusters and causes of common defects. Photographs.

1553* Crystallization of Quartz Glass. (Russian.) *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 355-358.

A study was made of the effect of additives on crystallization in a temperature field where tridymite is stable. Micrographs, tables, graphs. 4 ref.

1554 Electric Annealing and Auxiliary Heating in the Glass Industry. I. J. Horowitz. *Glass Industry*, v. 34, Nov. 1953, p. 599-603, 628.

Discusses theory of annealing, modern annealing procedures, and strains in glass. Graphs, diagrams. (To be continued.)

1555 Carbon in the Engineering and Metallurgical Industries. III. Industrial Graphites, Diamonds and Special Mixtures. V. S. Kingswood. *Metallurgia*, v. 48, no. 288, Oct. 1953, p. 169-174.

Discusses applications of industrial graphites, diamonds and special mixtures such as clay-graphite mixtures, silicon carbide, graphite-metal powder compacts, and porous and impervious

grades of carbon and graphite. Tables, photographs, diagram. 11 ref.

1556 The British Ceramic Research Association. A. E. Dodd. *Metallurgia*, v. 48, no. 228, Oct. 1953, p. 180-182.

Reports continued exposure to high temperature may have marked effect on thermal properties of both insulating and solid types of refractory. Photograph, graphs. 3 ref.

1557 Studies in the System Magnesia-Silica-Water at Elevated Temperatures and Pressures. Elmer T. Carlson, Richard B. Peppler, and Lansing S. Wells. *Journal of Research, National Bureau of Standards*, v. 51, Oct. 1953, p. 179-184.

Investigates reactions between magnesia and silica under hydrothermal and pneumatolytic conditions. Tables, graphs. 7 ref.

1558* How Asbetos Papers Are Made. *Paper Trade Journal*, v. 137, Oct. 30, 1953, p. 16-21.

Presents a comparison of special papermaking techniques demanded by asbestos fiber and recognized techniques of paper production from cellulose. Photographs, micrographs.

1559* Physical and Crystallographical Properties of Some Spinels. III. Preparation and X-Ray Investigation of Some Spinels. F. C. Romeijn. *Philips Research Reports*, v. 8, Oct. 1953, p. 321-342.

Presents data on aluminates, germanates, titanates, ferrites, and some more complicated systems. Tables, graphs. 32 ref.

1560* British Columbia Cement Company Expands Bamberton Plant. *Pit and Quarry*, v. 46, Nov. 1953, p. 84-89, 120.

Describes modernization program including equipment, plant layout, and operating procedures. Photographs.

1561* Barrell Finishing of Metal Products. H. Leroy Beaver. *Products Finishing*, v. 18, Nov. 1953, p. 46-48, 50, 52, 54, 56.

Discusses selection of a mineral for reducing surface area. Photograph.

1562* Refractories in the Service of Industry. D. Dixon. *Refractories Journal*, v. 29, Oct. 1953, p. 426-429.

A general discussion of various types of refractories and their uses. (To be continued.)

1563* Rotary Kiln Loading. Irving Warner. *Rock Products*, v. 56, Nov. 1953, p. 79-80, 122.

Describes pilot model kiln used in a study of the passage of particles through rotary kilns. Diagrams.

1564 Massive Khasi Sillimanite: A Natural Material Suitable for Tank Blocks. C. F. Griffith. *Society of Glass Technology, Journal*, v. 37, no. 178, Oct. 1953, p. 221T-239T + 8 plates.

Reviews history of deposits. Describes laboratory trials demonstrating suitability for glass tank blocks. Tables, diagrams, photographs. 13 ref.

1565 The Reactions Between Glass and Water. I. R. Beattie. *Society of Glass Technology, Journal*, v. 37, no. 178, Oct. 1953, p. 240T-248T.

Describes improved method of assessing chemical durability of glass. Graphs, table, diagram. 14 ref.

1566 Surface Durability of Optical Glass. H. E. Simpson. *Society of Glass Technology, Journal*, v. 37, no. 178, Oct. 1953, p. 249T-255T.

Reports that effect of high humidity upon surface durability of ground and polished reticules varies according to composition of the glass. Table, diagram, graph. 8 ref.

1567 Suitable Glass Compositions for Different Methods of Mechanical Manipulation: Window Glass. H. Cole. *Society of Glass Technology, Journal*, v. 37, no. 178, Oct. 1953, p. 256T-267T.

Presents historical review. Reports that composition of window glass has become standardized within relatively narrow limits of the Na_2O-CaO-MgO-Al_2O_3-SiO_2 system. Tables, diagram. 9 ref.

1568 The Dielectric Constant and Dissipation Factor of Soda-Potassia-Silica Glasses at Frequencies of 1 to 300 Kilocycles at Room Temperatures. George F. Stockdale. *University of Illinois Bulletin, (Engineering Experiment Station Bulletin Series* no. 411,) v. 50, no. 60, Apr. 1953, 27 p. (Tl 16b)

Specimen preparation and measuring techniques are described. Data are presented for 35 glass compositions which vary by 5% intervals. Graphs, tables, diagrams. 9 ref.

1569* Evolution of the Viscosity of Glass in Relation to the Temperature. (French.) Aniuta Winter-Klein. *Verres refractaires*, v. 7, no. 4, July-Aug. 1953, p. 217-226; disc., p. 226-227.

Discusses phenomenon of transitional phase in glass between solid and liquid phases. Describes its limits and variation of activation energy as a function of the temperature. Graphs, tables. 17 ref.

1570* Heterodynamics of Silicate Glasses. (Russian.) V. V. Tarasov and Ia. S. Savitskaia. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 5, May 1953, p. 744-752.

The ratio of Si and O atoms in the glass controls types of bonding, which in turn influence mechanical properties. Tables, graph, diagrams. 11 ref.

1571* Surface Conductivity of Glasses in a Moist Atmosphere. (Russian.) A. Ia. Kuznetsov. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 5, May 1953, p. 657-661.

Aqueous solutions of hydrolyzed silcates were found to be the cause of high conductivities. Tables. 7 ref.

1572* Influence of Barium Titanate on the Dielectric Properties of Metaphosphate and Metaborate Lead Glasses. (Russian.) I. N. Beliaev, A. L. Khodakov, and M. L. Sholokhovich. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 8, Aug. 1953, p. 1157-1162.

Barium titanate added to lead glasses caused dielectric penatrability to increase. Tables, graphs. 4 ref.

1573* On the State and Properties of Boric Anhydride in Silicate Glasses. (Russian.) A. A. Appen. *Journal Prikladnoi Khimii*, v. 26, no. 6, June 1953, p. 569-578.

Nature of change in borosilicate glasses, dependent on their composition, can be connected with definite concepts on the coordinated state of B. Tables, graphs. 18 ref.

1574* Influence of Preliminary Hydration on the Processes of Hardening of Asbestos Cement. (Russian.) T. M. Berkovich. *Zhurnal Prikladnoi Khimii*, v. 26, no. 7, July 1953, p. 691-702.

Preliminary hydration with simultaneous mixing, influences the cement setting processes. Tables, graphs. 6 ref.

1575* Application of Calcium Saccharates as Plasticizers for Cement Solutions and Concrete. (Russian.) Iu. E. Kornilovich and L. G. Gulinova. *Zhurnal Prikladnoi Khimii*, v. 26, no. 8, Aug. 1953, p. 876-879.

Examines influence of sugar additives on strength of cements of various chemical compositions. Results indicate necessity of creating a new hydrocarbon plasticizer for concretes prepared from wastes in sugar industry. Micrographs, tables. 5 ref.

See also:
1804 (fish scaling of porcelain enamel)
1853 (stannate and titanate capacitors)
1914 (electrolytically applied ceramic coating)
2009 (analysis of glass markets)
2478 (metal-ceramic interactions)
2481 (manufacture and properties of cermets)
2601 (physical properties of BaO crystals)

CHEMICAL ENGINEERING

1576* Emulsifiers for 1954. *Agricultural Chemicals*, v. 8, Nov. 1953, p. 48-51, 125-127, 129-131.

A review of the characteristics of some new and old materials. Includes suggestions on selection of emulsifying agent for each application and how to formulate properly to assure optimum results in the field.

Chemical Engineering

1577* Liquid-Liquid Extraction. Thomas W. Pratt. *American Oil Chemists' Society, Journal*, v. 30, Nov. 1953, p. 497-505.

Describes application of partial solubility to separation of liquid mixtures of two or more components. Graphs, diagrams. 4 ref.

1578* Present Practices in Industrial Water Conditioning. Bert I. Thorngren. *American Oil Chemists' Society, Journal*, v. 30, Nov. 1953, p. 563-567.

Reviews methods available for treatment of boiler water and cooling water.

1579* Present Status of Scientific Research on Industrial Catalysis. (German.) Georg-Maria Schwab. *Angewandte Chemie*, v. 65, no. 20, Oct. 21, 1953, p. 502-507.

Survey includes discussion on heat transfer and temperature distribution; flow rates and diffusion; thermodynamics and kinetics of chemical reactions; and functions and effects of single and mixed catalysts. Graphs.

1580* Fractional Distillation. I. Theory, New Data, Laboratory Distillation, Packed Columns. H. H. M. Jones. *Chemical & Process Engineering*, v. 34, Nov. 1953, p. 350-352, 359.

86 references.

1581* Ultrasonics in Industry. A Critical Assessment. I. Methods of Generation. M. H. M. Arnold. *Chemical & Process Engineering*, v. 34, Nov. 1953, p. 360-362.

Includes tables, photographs. (To be continued.)

1582 Low-Cost Froth Flotation. D. H. Gregory, D. Simpson, and P. F. Whelan. *Coal Age*, v. 58, Nov. 1953, p. 94-95.

Describes portable plant for British mines which recovers 5½ tons per hour of clean fine coal with only two operators. Diagram, table.

1583* A Symposium on Measures to Prevent Over-Pressure of Gas Systems. *Gas Age*, v. 112, Nov. 5, 1953, p. 32-35.

Includes "Mechanical Relief Devices; Experiences at Denver", Donald J. Miller; "Advantages and Disadvantages of Automatic Shut-Off", Gordon G. Dye; and "Oil Seals for Protection of Distribution Systems", Henry W. Parker. Diagrams.

1584 The Use of Organo-Silicate Heat Transfer Fluid for High Temperature Distillation. H. D. Mills. *Industrial Chemist and Chemical Manufacturer*, v. 29, Nov. 1953, p. 529-534.

A description of an installation using tetra aryl silicate. Tables, photographs, diagram.

1585 Drying of Ammonium Sulphate. *Industrial Chemist and Chemical Manufacturer*, v. 29, Nov. 1953, p. 535-536.

Discusses operating principle and test results of a rotary louvre drier. Diagram, photographs.

1586 Demineralization of Water by Electrolytic and Ion Exchange Processes. L. Streicher, A. E. Bowers, and R. E. Briggs. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2394-2401.

Pilot plant tests show that electrolyte-ion exchange system is most economical for waters with 1000-2000 ppm. dissolved solids in areas having cheap electrical power. Process does not yet apply to sea water. Photographs, tables, diagrams. 11 ref.

1587 Ion Exchange of Trace Components In a Countercurrent Equilibrium Stage Contactor. Nevin K. Hiester, Russell C. Phillips, Earl F. Fields, Raymond K. Cohen, and Shirley B. Radding. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2402-2412.

Describes a method for determination of number of countercurrent contacts required for any degree of ion separation. May apply to other fluid-solid operations. Photographs, diagrams, tables, graphs. 6 ref.

1588 Recovery of 2,3-Butanediol From Fermented Beet Molasses Mashes. J. A. Wheat. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2387-2394.

Molasses mash, fermented by *Aerobacter aerogenes*, is stripped of ethanol, concentrated, and stripped of diol. Ninety-eight per cent butenediol at 25.6c per pound is estimated. Photograph, diagrams, tables. 34 ref.

1589 Kinetics of Carbon Gasification by Steam. Mechanism of Interaction of Low Temperature Char and Steam-Hydrogen Mixtures at 1600 F. G. E. Goring, G. P. Curran, C. W. Zielke, and Everett Gorin. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2586-2591.

Data are presented on deviation from water-gas shift equilibrium; methane formation; and carbon monoxide inhibition. Tables, graphs. 8 ref.

1590 Sintering as a Physical Process. H. B. Wendeborn. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 260-288.

Discusses down-draft sintering process, heat transfer by gas and air during sintering and reactions and heat transfer in the sinter bed. Heat balance examples are given. Tables, diagrams. 8 ref.

1591* Pocahontas Pioneers a Preparation Plant. *Mechanization*, v. 17, Oct. 1953, p. 99-103.

Describes equipment, plant layout, and operating procedures for coal company. Photographs, table, diagram.

1592* Selection of Wetting Agents for Coal. H. B. Charmbury and D. R. Mitchell. *Mechanization*, v. 17, Oct. 1953, p. 111-113.

Describes fundamental considerations in selection. Shows how proper agent can be found by simple test procedures. Photographs, diagram, graph.

1593 Electronic Control in Petroleum Processing. W. T. Marchment. *Oil and Gas Journal*, v. 52, Nov. 9, 1953, p. 124, 127, 129-130.

Describes design and operation of equipment in which a current-transmitting system is used. Diagrams, photographs.

1594 New Reforming Process. *Oil and Gas Journal*, v. 52, Nov. 16, 1953, p. 186-187.

Describes "ultraforming", a cyclic catalyst regeneration method of reforming.

1595 Continuous-Coking Process Shows Ability to Handle Heavy Feed Stocks. Valentine Mekler, A. Schutte, and T. T. Whipple. *Oil and Gas Journal*, v. 52, Nov. 16, 1953, p. 200-203.

Describes equipment and procedures for continuous contact coking process of petroleum refining. 3 ref.

1596 Fluid Coking of Residua. A. Voorhies, Jr. and H. Z. Martin. *Oil and Gas Journal*, v. 52, Nov. 16, 1953, p. 204-207.

Describes process which results in increased production of lighter petroleum products and decreased production of heavy fuel oil. Photograph, micrograph, diagrams.

1597 How to Predict Natural-Gasoline Content of Produced Fluids from Field Separation Data. Samuel G. Miller. *Oil and Gas Journal*, v. 52, Nov. 23, 1953, p. 85, 87-89.

Broad limits covered by data on which this correlation is based may make findings of value for predictions in other areas. Graphs.

1598 Huge Petrochem Plant Dedicated. George Weber. *Oil and Gas Journal*, v. 52, Nov. 23, 1953, p. 48-49.

New plant hikes synthetic ethyl alcohol output by 20%. Photographs, diagram.

1599 Use of Wire-Mesh Sections in Asphalt Entrainment Control in Vacuum Pipe Stills. II. J. W. Russell. *Oil and Gas Journal*, v. 52, Nov. 23, 1953, p. 94-96.

Covers case history of three refineries use of wire mesh sections in asphalt entrainment control in vacuum pipe stills. Diagrams, tables.

1600* How to Get Sulphur Dioxide From Pyrrhotite. J. T. Hegeman. *Paper Trade Journal*, v. 137, Nov. 6, 1953, p. 14-16.

Discusses fluosolids roasting of sulfides for production of SO_2. Diagrams, table. 6 ref.

1601* Oils and Chemicals. *Petroleum*, v. 16, no. 11, Nov. 1953, p. 317-322.

Laboratory studies of synthesis of oils and chemicals from carbon monoxide and hydrogen made from coal and coke has led to improvements in catalysts used for the process and advances in knowledge of the mechanism of chemical reactions involved. Design and construction of pilot plant to extend studies is discussed. Tables, graph, photographs. 2 ref.

1602* Catalytic Desulphurisation. *Petroleum*, v. 16, no. 11, Nov. 1953, p. 331-332.

Details of the "Autofining" process are given including equipment, operating procedures, and investment costs. Photographs, tables, diagram.

1603 Air Cooling Improves Economy of New Gasoline Plant Operation. Arch L. Foster. *Petroleum Engineer*, v. 25, Nov. 1953, p. C5-C7.

Discusses use of atmospheric air on primary, secondary, debutanizer reflux condensers, and engine lubricating oils. Photographs, tables.

1604 French Plants Make Alcohols, Solvents, Detergents. V. S. Swaminathan. *Petroleum Engineer*, v. 25, Nov. 1953, p. C19, C22-C23, C26.

Discusses production of isophopyl alcohol, acetone, and "Tecpol" from refinery olefins. Diagrams, photographs.

1605 First Cat Cracker in New England. *Petroleum Processing*, v. 8, Nov. 1953, p. 1689-1691.

New fluid unit built by Standard Oil, uses 30% less steel, one expansion joint, and no slide valves. Photograph, diagram, table.

1606 After-Filters Remove Wax "Haze." D. P. Thornton, Jr. *Petroleum Processing*, v. 8, Nov. 1953, p. 1697-1699.

One company's solution to the problem of haze in lube oils by use of extra filters. Diagram, photograph.

1607 If You Can't Modernize All at Once—Do It in Steps. David B. Ardern. *Petroleum Processing*, v. 8, Nov. 1953, p. 1700-1704.

Shows how an intensified and well planned modernization program can quickly improve the competitive position of even a small refiner in today's markets. Tables, diagrams.

1608 Fast Spectro Method for Trace Determinations in Lube Oils. J. T. Rozsa and L. E. Zeeb. *Petroleum Processing*, v. 8, Nov. 1953, p. 1708-1712.

Includes photographs, tables. 24 ref.

1609 Plant Analyzer Samplers That Work. *Petroleum Processing*, v. 8, Nov. 1953, p. 1717-1720.

Discussion of three systems designed to deliver proper samples to the petrochemical process analytical instrument. Diagrams.

1610 Synthetic Phenol Manufacture. III. Sulfonation and Chlorination. Peter W. Sherwood. *Petroleum Processing*, v. 8, Nov. 1953, p. 1722-1728.

Covers sources, markets, and the four major processes—cumene hydroperoxide, Raschig, sulfonation, and chlorination. Diagram, photographs. 14 ref.

1611* Reducing Evaporation Losses of Crude Oil. E. G. Ellerbrake and F. Veatch. *Petroleum Times*, v. 62, Nov. 13, 1953, p. 1133-1137.

Discusses ways of reducing losses of petroleum products during storage. Graphs, tables.

1612* Manufacturing Magnesium Pyrophosphate From Apatite and Serpentine. (Polish.) K. Akerman, J. Dankiewicz, M. Dankiewicz, E. Gryglik, Z. Pletti, and K. Przylecka. *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 495-497.

Experiments on laboratory and pilot plant scale at 1500 C are described. Difficulties connected with corrosion of the lining by melted phosphate have been eliminated. Tables. 14 ref.

1613* Mineral Synthetic Materials in Building Chemical Apparatus. (Polish.) L. Winogradow. *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 521-526.

Describes application of several rocks and derivatives. Presents details of apparatus design. Diagrams, photographs.

1614* Partial Replacement of Apatite With Polish Phosphorites in Production of Calcinated Pyrophosphates. (Polish.) Z. Eckstein, A. Sacha, Zd. Dominiak, and Z. Sobotka. *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 536-538.

It has been found that reaction between hydroxylamine and methyl ester of 5-bromosalicylic acid can be applied as an industrial method. 6 ref.

1615* Mass Transfer. T. K. Sherwood. *Research*, v. 6, Nov. 1953, p. 423-427.

Discusses some of the fundamental relations of mass transfer. Shows their similarity to equations of heat transfer and fluid friction. Discusses counter-current flow and indicates possible developments in the design of mass transfer equipment. Graphs, diagrams. 5 ref.

1616 High-Speed Photography in the Chemical Industry. W. O. S. Johnson. *Society of Motion Picture and Television Engineers, Journal*, v. 61, Nov. 1953, p. 619-623.

Describes development work on cameras, lights, and associated equipment for use in high speed motion analysis. Photographs.

1617 Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1952.) S. J. Aresco and C. P. Haller. *U. S. Bureau of Mines, Report of Investigations* 4972, Oct. 1953, 68 p. (Tn21 Un3r)

Discusses composition and physical properties of coals from various states. Tables. 7 ref.

1618* Chemical Reactions in Turbulent Layers. (German.) H. Nonnenmacher. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, p. 512-518.

Turbulent flow or Houdry-flow process in which finely pulverized solids are turbulated by a gas stream was shown to be important in chemical processes, conveyance of solid substances, and transfer of thermal energy. 23 ref.

1619* The Thermal Oxidation of Iron Sulfide With Sulfur Dioxide to Form Elementary Sulfur. (German.) W. Morawietz. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, 539-548.

Theoretical and experimental studies have shown that pyrite was first thermally reduced to ferrous sulfide before it was oxidized into magnetite. Tables, diagrams, graphs, 11 ref.

See also:
1718 (synthesis of petrochemicals)
1924 (applying electrical energy to chemical processes)
2480 (kinetics of grinding processes)

CHEMISTRY—ANALYTICAL AND INORGANIC

1620 The Spectrophotometric Determination of Ionization Constants of Basic Dyes. Siegfried Woislawski. *American Chemical Society, Journal*, v. 75, Nov. 15, 1953, p. 5201-5203.

Ionization constants of 14 basic dyes belonging to 5 chemical classes: azo, azines, xanthenes, oxazines and thiazines were determined. Table. 4 ref.

1621 A Reversion Method for the Absorptiometric Determination of Traces of Lead With Dithizone. H. M. Irving and E. J. Butler. *Analyst*, v. 78, Oct. 1953, p. 571-580.

A method is described for determination of Pb in small samples of biological materials. Tables. 16 ref.

1622 A Colorimetric Determination of Dihydrostreptomycin. G. C. Ashton, M. C. Foster, and M. Fatherley. *Analyst*, v. 78, Oct. 1953, p. 581-585.

Method can be used with high salt concentrations and for routine factory analyses. Penicillin and its compounds do not interfere. Graphs, tables. 15 ref.

Chemistry—Analytical and Inorganic

1623 The Determination of Copper in Plant Material. W. A. Forster. *Analyst*, v. 78, Oct. 1953, p. 614-616.

In the presence of the ammonium salt of ethylenediaminetetraacetic acid, Cu can be determined colorimetrically as the diethyldithiocarbamate complex without interference from Al, Co, Fe, Mn, Ni, Zr, Ca, Mg, and P. Tables. 5 ref.

1624 Analytical Chemistry of Beryllium. Frank A. Vinci. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1580-1585.

Reviews the above. Diagrams, graph, table. 56 ref.

1625 Spectrophotometric Determination of Selenium and Tellurium in Concentrated Sulfuric Acid. Stephen E. Wiberley, Lewis G. Bassett, Arthur M. Burrill, and Helen Lyng. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1586-1588.

Includes graphs, table. 5 ref.

1626 Determination of Impurities in Germanium and Silicon. C. L. Luke and Mary E. Campbell. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1588-1593.

As a result of the current interest in the use of semiconductors in electronics it has been necessary to develop quantitative chemical methods for determination of metal immpurities in semiconductor materials employed. Methods are designed to be used for quality control of raw materials and as an aid in research and manufacturing processes. 5 ref.

1627 Analytical Chemistry of Micro Quantities of Beryllium. Taft Y. Toribara and Ruth E. Sherman. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1594-1597.

Because of its very toxic nature sub-microgram quantities of Be are of biological importance. Tables, graph. 24 ref.

1628 Analytical Chemistry of Uranium. Clement J. Rodden. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1598-1601.

Papers on gravimetric, volumetric, colorimetric, fluorimetric, and radiochemical methods, X-ray absorption and coulometric procedures are reviewed. Graphs. 79 ref.

1629 Solvent Extraction Separations of Ziroconium and Niobium. Edith M. Scadden and Nathan E. Ballou. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1602-1604.

Extraction characteristics of a variety of solvent systems have been examined for the purpose of finding a method for quickly and efficiently isolating Zr and Nb from all other fission product elements. Tables. 6 ref.

1630 Spectrographic Determination of Impurities in Zirconium and Hafnium. Neil E. Gordon, Jr. and Ralph M. Jacobs. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1605-1608.

Recent developments in production have made it necessary to develop methods for determining a large number of trace elements in these materials. Tables. 9 ref.

1631 Direct Determination of Oxygen in Less Femiliar Metal Oxides. Henry R. Hoekstra and Joseph J. Katz. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1608-1612.

Procedure for the above was developed. Diagrams, tables. 11 ref.

1632 Reactions Involving Colored Complexes of the Platinum Metals. Gilbert H. Ayres. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1622-1627.

Outlines briefly methods available for determining the reaction stoichiometry in the formation of colored products in solution. Graphs. 26 ref.

1633 Behavior of Platinum Group Metals Toward Ion Exchange Resins. William M. MacNevin and Warren B. Crummett. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1628-1630.

25 ref.

1634 Determination of Total Nitrogen in Petroleum Distillates by Catalytic Hydrogenation. Charles Wankat and J. G. Gatsis. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1631-1633.

Data are presented on synthetic samples containing the types of nitrogen compounds found in petroleum as well as results on a variety of light petroleum distillates, both virgin and cracked. Tables. 8 ref.

1635 Tetraphenylphosphonium and Tetraphenylstibonium Chlorides as Analytical Reagents. Hobart H. Willard and Lowell R. Perkins. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1634-1637.

Includes tables. 9 ref.

1636 Determination of Malic, Tartaric, and Citric Acids in Fruit by Ion Exchange Chromatography. Henry H. Schenker and William Rieman, III. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1637-1639.

Describes a procedure in which the acids are separated by ion exchange chromatography and then determined by oxidation with permanganate. Method is applicable to fruit, fruit juices, and fruit products. Tables, graph. 6 ref.

1637 Titrimetric Determination of Thorium. James J. Fritz and John J. Ford. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1640-1642.

Method consists of a direct titration of thorium with a standard solution of disodium ethylenediaminetetraacetate (Versene), a soluable complex being formed. Tables, graph. 11 ref.

1638 Determination of Calcium in Biological Material by Flame Photometry. P. S. Chen, Jr. and T. Y. Toribara. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1642-1644.

Procedures are given for determination of calcium in blood serum, serum ultrafiltrate, and urine. Tables, graphs. 7 ref.

1639 Quantitative Determination of Methyl Mercaptan, Dimethyl Disulfide, and Dimethyl Sulfide in a Gas Mixture. William Segal and Robert L. Starkey. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1645-1648.

Method should find application where quantitative determination of mercaptans and alkyl sulfides is needed. Diagram, table. 11 ref.

1640 Determination of Traces of Hydrogen Fluoride in Inert Gases. D. L. Manning and J. C. White. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1648-1650.

Method developed is particularly valuable for industrial application when no other ionizable gases are present. Graphs, tables. 5 ref.

1641 Titration Curve for Argentometric Determination of Cyanide. John E. Ricci. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1650-1656.

The shape of the curve of p[Ag^+] in the titration of KCN with $AgNO_3$ was investigated, to determine the position of the inflection point relative to the equivalent point. Graphs, tables.

1642 Detemination of Dextran With Anthrone. Troy A. Scott, Jr. and Eugene H. Melvin. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1656-1661.

Anthrone method was used for determination of concentration of dextran solutions. Effects of factors involved in the method were studied. A procedure designed to improve the precision was evolved. Graphs, tables. 13 ref.

1643 Determination of the Gamma Isomer Content of Benzene Hexachloride. John T. Craig, P. F. Tryon, and W. G. Brown. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1661-1663.

Discusses development of a new isotope dilution method using chloride-36-labeled pure γ isomer as a tracer. Tables, diagrams. 7 ref.

1644 Automatic Combustion Apparatus for Determination of Sulfur and Halogen. Theodore T. White, Carl J. Penther, Philip C. Tait, and Francis R. Brooks. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1664-1668.

Includes diagrams, table, photograph.

1645 Extraction of Heteropoly Acids. Coe Wadelin and M. G. Mellon. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1668-1673.

A study was made of liquid-liquid extraction to evaluate its applicability to separations of heteropoly acids. Method was successfully applied to National Bureau of Standards steel

samples containing up to 1.4% Mn, 0.3% Si, 1.0% Cr, or 0.2% V. Graphs, tables. 31 ref.

1646 Fractionation of Barium-Radium Mixtures as Chromates. Murrell L. Salutsky, Joseph G. Stites, Jr., and A. W. Martin. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1677-1681.

Fractional precipitation from homogeneous solution was investigated as a method for the rapid concentration of Ra from Ba-Ra mixtures. Tables, graphs. 24 ref.

1647 Methods for Determining Hydrocarbons and Phenols in Water. C. E. Headington, chairman. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1681-1685.

Report of the Subcommittee on Refinery Effluent-Water Analytical Methods, Committee on Analytical Research, Div. of Refining, Amer. Petroleum Inst. Tables. 17 ref.

1648 Determination of Trace Elements in Fuel Oils. C. W. Key and G. D. Hoggan. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1673-1676.

Method was developed to provide a rapid and accurate means of determining the concentration of V, Na, Ni, and Ca in residual fuel oils without prior ashing. Graphs, tables, diagram. 8 ref.

1649 Precision Recording Refractometer for Chromatographic Analysis. Nelson R. Trenner, Charles W. Warren, and Stanley L. Jones. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1685-1690.

Apparatus is particularly useful in chromatographic investigations and analyses. Photographs, diagrams, graphs. 10 ref.

1650 Mercury Pool Polarography. Carl A. Streuli and W. Donald Cooke. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1691-1696.

In order to extend the range of polarographic methods, possible analytical applications of a large polarized Hg pool electrode were investigated. Graphs, tables, diagram. 9 ref.

1651 Tabulated Diffraction Data for Hexagonal Isomorphs. L. K. Frevel and H. W. Rinn. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1697, 1716-1717.

The authors have tabulated 117 hexagonal prototype structures, arranged 1287 hexagonal substances according to the ascending order of their axial ratios, and obtained representative powder diffraction patterns for 53 hexagonal structures. Tables. 19 ref.

1652 Quantitative Determination of Oxygen in Gases. Leonard P. Pepkowitz and Edwin L. Shirley. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1718-1720.

Method described is based on the Winkler manganous hydroxide reaction. Diagram, photograph, table. 7 ref.

1653 Infrared Spectra of Metal Isopropoxides. Jerome V. Bell, Julius Heisler, Harvey Tannenbaum, and Jerome Goldenson. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1720-1724.

Infrared spectra of the triisopropoxides of Al, B, and P and the tetraisopropoxide of Ti were determined. Tables, graphs. 11 ref.

1654 Colorimetric Determination of Tetrachlorohydroquinone. Sverre Dahl. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1724-1727.

Method was developed for determining tetrachlorohydroquinone or chloranil in mixtures similar to leather extracts. Graphs, tables. 6 ref.

1655 Hyrdogen Fluoride Solvent System. John W. Sargent, Alan F. Clifford, and Warren R. Lemmon. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1727-1729.

Design of an apparatus to facilitate future studies in the hydrogen fluoride system. Diagrams, graph. 3 ref.

1656 Universal Anticipation of End-Point System for Automatic Titrations. W. N. Carson, Jr., *Analytical Chemistry*, v. 25, Nov. 1953, p. 1733-1735.

Work was done to find a means for preventing over-titration in automatic titrations. Diagrams, table. 4 ref.

1657 Determination of Polystyrene in Styrenated Alkyd and Styrenated Epoxy Resins. Melvin H. Swann. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1735-1737.

Quantitative method for determining polystyrene for quality control and acceptance of quick-drying styrene-modified alkyd resins. Table. 3 ref.

1658 Direct Microdetermination of Sodium, Potassium, and Calcium. George R. Kingsley and R. Schaffert. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1738-1741.

Investigation was undertaken to develop a practical flame photometric method for the microdetermination of Na, K, and Ca in a single biological preparation. Graph, tables. 14 ref.

1659* A Fully Automatic Apparatus for Solid-Liquid Phase Counter-Current Distribution. C. J. O. R. Morris. *Biochemical Journal*, v. 55, Oct. 1953, p. 369-371.

Describes apparatus, its operation, and an adaptation. Diagram. 3 ref.

1660 Determination of Fluorides. Joseph M. Icken and Bernard M. Blank. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1741-1742.

Spectrophotometric adaption of method of Assoc. of Official Agricultural Chemists. Graphs, tables. 6 ref.

1661 Mass Spectrometric Determination of Gas Impurities Separable by Condensation. Amos S. Newton. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1746-1749.

Methods of utilizing an internal standard in the mass spectrometric determination of traces of noncondensable impurities in noncondensable gases is presented. Tables. 10 ref.

1662 Separations With a Micro Mercury Cathode. Richard B. Hahn. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1749-1750.

Electrodes of Cu, Pb, and pure Pt were also used as bases for the Hg coating, but were not so satisfactory as the Ag electrode described. Tables, diagram. 5 ref.

1663 Determination of Schiff Bases by Titration in Nonaqueous Solutions. Stanley K. Freeman. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1750-1751.

Includes graphs, table. 17 ref.

1664 Polarographic Determination of Molybdenum in Presence of Tungsten. Louis Meites. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1752-1753.

Includes graphs, tables. 4 ref.

1665 Separation of Cerium From the Rare Earths by Precipitation as Iodate From Homogeneous Solution. Hobart H. Willard and Sylvia T'Sai Yu. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1754-1756.

Includes tables, graphs, photograph. 3 ref.

1666 1-Fluoro-2,4-Dinitrobenzene as a Quantitative Reagent for Primary and Secondary Amines. Floyd C. McIntire, Lois M. Clements, and Muriel Sproull. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1757-1758.

Includes table, graph. 6 ref.

1667 Determination of Zirconium in Aluminum Alloys. Roland A. Papucci, Diane M. Fleishman, and Joseph J. Klingenberg. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1758-1760.

Describes method for determination using *p*-Bromo- or *p*-Chloromandelic acid. Tables. 6 ref.

1668 Separation of Hydrogen Peroxide From Organic Hydroperoxides. William M. MacNevin and Paul F. Urone. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1760-1761.

Includes graphs, table. 3 ref.

1669 New Flux for Determination of Total Carbon in Silicon Carbide. Paul L. Norton. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1761-1762.

Includes tables.

Chemistry—Analytical and Inorganic

1670 Assay of Certain Organic Materials by Dichromate Oxidation. Norman F. Schulz. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1762-1764.

Includes graphs, tables. 8 ref.

1671 Determination of Primary Fatty Amines in Amine Mixtures. John E. Jackson. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1764-1765.

Includes tables, graph. 3 ref.

1672 Field Method for Determination of Traces of Arsenic in Soils. Confined Spot Procedure Using a Modified Gutzeit Apparatus. Hy Almond. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1766-1767.

Includes tables, diagrams. 8 ref.

1673 Rapid Accurate Determination of Carbohydrates and Other Substances With the Dichromate Heat-of-Dilution Method. Herbert F. Launer and Yoshio Tomimatsu. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1767-1769.

Includes tables. 8 ref.

1674 Rapid Accurate Determination of Cellulose With the Dichromate Heat-of-Dilution Method. Herbert F. Launer and Yoshio Tomimatsu. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1769-1770.

Includes table. 10 ref.

1675* Testing Quaternary Ammonium Germicides. G. R. Goetchius and H. Grinsfelder. *Applied Microbiology*, v. 1, Nov. 1953, p. 271-277.

An investigation was undertaken to develop an improved test procedure for evaluating bactericidal effectiveness of alkyl (C_9-C_{18}) tolyl methyl trimethyl ammonium chloride (50 per cent). Tables, graphs. 11 ref.

1676* Flame Spectroscopic Investigation of Heavy Metals, Especially for Determining the Composition of Ferrite in Steels. (German.) Franz Wever, Walter Koch, and Gert Wiethoff. *Archiv für das Eisenhüttenwesen*, v. 24, nos. 9-10, Sept.-Oct. 1953, p. 383-391; disc., p. 391.

Effects of electrolyte solvent, alloying elements, and fuel-gas composition on intensity of flame spectrum are investigated. Tables, graphs, diagrams, photographs. 9 ref.

1677* Use of Chromotropic Acid for Photometric Determination of Titanium in Pig Iron and Steels. (German.) Walter Koch and Heinrich Ploum. *Archiv für das Eisenhüttenwesen*, v. 24, nos. 9-10, Sept.-Oct. 1953, p. 393-396; disc., p. 396.

Includes table, graphs. 5 ref.

1678* Periodic Structures, Rhythmic Chromatograms, and Radio-Isotopes. Herbert Weil. *Atomics (British)*, v. 4, Nov. 1953, p. 286-291.

Shows that an overlapping of periodic structures and chromatograms may occur. Graph. 39 ref.

1679 Gas Analysis. *Canadian Chemical Processing*, v. 37, Oct. 1953, p. 108-109.

Discusses methods of measuring sulfur dioxide, carbon dioxide, and oxygen. Diagrams.

1680 The Analysis of Cobalt. V. Colorimetric Methods. *Chemical Age*, v. 69, Oct. 31, 1953, p. 909-912.

Describes determination of Co in soils and steels. 34 ref.

1681* Formation of Periodate by Induced Oxidation. (German.) Karl Gleu and Walter Katthän. *Chemische Berichte*, v. 86, no. 9, 1953, p. 1077-1084.

Describes experiments where permanganate is the donor, nitrate is the inductor, and iodate is the acceptor. The maximum induction factor may be determined with a new periodate titration or a photometric method. Tables.

1682* Chemical Problems in the Flotation of Sulfide Ores. (Swedish.) Carl Du Rietz. *IVA Tidskrift for Teknisk-Vetenskaplig Forskning*, v. 24, no. 6, 1953, p. 257-266.

Analytical determination of xanthates was made by potentiometric titration with $AgNO_3$ solutions. Tables, graphs, diagram.

1683 Some Chemistry of Covalent Compounds With a Single Central Atom. Leallyn B. Clapp. *Journal of Chemical Education*, v. 30, Nov. 1953, p. 584-590.

Discusses preparation and reactions of covalent halides. Tables. 41 ref.

1684* Spectrophotometric Determination of Niobium. A. K. Das Gupta and S. K. Dhar. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Sept. 1953, p. 396-400.

Describes conditions for estimation of microgram amounts of Nb in the presence of moderate excess of Ta and Ti by forming a complex with sulphosalicylic acid and measuring its adsorption. Graphs, tables. 8 ref.

1685* Metals in Phosphating Solutions. Determination by Ion Exchange. Gunnar Gabrielson. *Metal Finishing*, v. 51, Nov. 1953, p. 63-64, 69.

A method is presented for the determination of the metal content in phosphating baths by means of a cation exchanger in the hydrogen form. 4 ref.

1686 A Method of Metallurgical Microspectroscopy. Ford R. Bryan and Cleo H. Neveu. *Metal Progress*, v. 64, Dec. 1953, p. 82-85.

Describes techniques, equipment, and applications of method for identifying microconstituents of metallurgical specimens. Photographs.

1687 Use of a Scintillation Spectrometer in Radiochemical Analysis. B. Kahn and W. S. Lyon. *Nucleonics*, v. 11, Nov. 1953, p. 61-63.

A NaI (Tl) crystal γ-ray spectrometer was calibrated with respect to γ energy and efficiency between energies of 30 k.e.v. and 2.76 m.e.v. Several applications of the instrument to radiochemical problems are reported. Photographs, graphs, table. 9 ref.

1688 Rapid Method for Determination of Sulfur in Gasoline. Willis R. Battles. *Petroleum Engineer*, v. 25, Nov. 1953, p. C47-C49, C52.

A rapid lamp method was developed with an average error of less than 3%. Tables, photographs. 5 ref.

1689* Application of Paper Chromatography to Determine Vitamin B_{12} in Liver Extracts. (Polish.) J. Bogucka, J. Iwanowska, and H. Kakol. *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 512-513.

Composition of solvent and conditions permitting determination of growth area in the shape of ellipse with clear outline have been established. 6 ref.

1690* Optical Conditions for Quantitative Ultra-Violet Microspectroscopy. R. J. King and E. M. F. Roe. *Royal Microscopical Society, Journal*, v. 73, ser. 3, 1953, p. 82-93 + 2 plates.

Adaptation of the Cooke, Troughton, and Simms ultra-violet microscope for quantitative absorption measurements at a limited number of wave-lengths in the ultra-violet is described. Graphs. 18 ref.

1691 Studies on Analysis With Electrophotometer. I. Designing and Construction of the Apparatus, Its Properties and Application in Fluorescence Titration. (English.) Soichiro Musha. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 1, Feb. 1953, p. 42-46.

Includes graphs, diagram, table.

1692 Semimicro Determination of Beryllium in Copper-Beryllium Alloy. (English.) Hidehiro Goto and Yachiyo Kakita. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 2, Apr. 1953, p. 163-171.

After separating Be from Cu by precipitating with guanidine carbonate, Be was determined colorimetrically with aurin tricarbonylic acid. Graphs, tables.

1693 Studies on the Analytical Method by Means of Photoelectric Colorimeter. II. Micro-Colorimetric Determination of Sulfide by Use of P-Phenylenediamine and Dimethyl-P-Phenylenediamine. (English.) Soichiro Musha. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 3, June 1953, p. 232-237.

Includes graphs, tables.

1694 Utility of Isotopes in Metallurgy. Henry C. Boynton and A. D. Kirshenbaum. *Steel*, v. 133, Nov. 9, 1953, p. 130-133.

Tracer elements were found to be valuable shortcut in quantitative analysis of oxygen in such metals as iron, steel and copper. Diagrams, tables.

1695 Standard X-Ray Diffraction Powder Patterns. v. 2. Data for 30 Inorganic Substances. Howard E. Swanson and Ruth K. Fuyat. *U. S. National Bureau of Standards Circular* 539, June 15, 1953, 65 p. (T21 Un3c)

Twenty-eight standard X-ray diffraction powder patterns are presented in revision of one hundred corresponding patterns in the ASTM card file. Two patterns not represented in the file are also included. Tables. 191 ref.

1696* Use of Radioactive Isotopes in Analytical Chemistry. (Russian.) M. B. Neiman and V. B. Miller. *Uspekhi Fizicheskikh Nauk*, v. 50, no. 1, May 1953, p. 93-122.

Distillation, dilution, titration, precipitation, and adsorption methods are described. Photographs, diagrams, graphs, tables. 79 ref.

1697* Quantitative Cathode-Ray Polarography. (German.) Kurt Cruse and Wolfgang Heberle. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, p. 579-590.

Describes design, function of parts, and uses of a cathode-ray polarograph yielding quantitative oscillograms. Diagrams, graphs, photographs. 19 ref.

Books and Miscellaneous Publications

1698 Inorganic Chemistry. E. de Barry Barnett and C. L. Wilson. 512 p. 1953. Longmans Green and Co., London. (QD151 B26i)

Deals briefly with atomic weight determination; crystal chemistry and stereochemistry; quantum theory; and nature of valency and radioactive change. The elements and their more important compounds are described systematically. Chemical reactions involved in important industrial processes are discussed. Includes much information obtained from Germany after the war, and usually available only in government publications.

1699 Practical Chromatography. Robert C. Brimley and Frederick C. Barrett. 128 p. 1953. Reinhold Publishing Co., New York. (QD271 B77p)

Covers latest techniques, equipment, and applications of paper, adsorption, partition, and ion-exchange chromatography.

See also:
1483 (analysis of celery seeds)
1608 (trace determination of lube oils)
2095 (determination of TEL in fuels)

CHEMISTRY—ORGANIC

1700 Fischer-Tropsch Synthesis Mechanism Studies. The Addition of Radioactive Alcohols to the Synthesis Gas. J. T. Kummer and P. H. Emmett. *American Chemical Society, Journal*, v. 75, Nov. 5, 1953, p. 5177-5183.

Results indicate that complexes resembling adsorbed alcohols are formed from carbon monoxide and hydrogen during synthesis and act as intermediates in the building up of higher hydrocarbons over iron catalysts.

1701* The Alkali Isomerization of a Methyl Decosahexaenoate and the Spectral Properties of Conjugated Fatty Acids. Earl G. Hammond and W. O. Lundberg. *American Oil Chemists' Society, Journal*, v. 30, Nov. 1953, p. 433-438.

Includes graphs, tables. 25 ref.

1702* A Methyl Docosahexaenoate: Its Isolation and Characterization. Earl G. Hammond and W. O. Lundberg. *American Oil Chemists' Society, Journal*, v. 30, Nov. 1953, p. 438-441.

Includes tables. 28 ref.

1703 Fundamentals of Paint, Varnish and Lacquer Technology. Chapt. VIII. Oils. I. Recent Developments in Raw Materials. Elias Singer. *American Paint Journal*, v. 38, Nov. 23, 1953, p. 64, 66, 68, 68b, 70, 72, 74, 76, 78.

Discusses the more recent developments in oils and their effect in changing properties so as to make them more desirable after processing. (To be continued.)

1704 The Fulvenes. Jesse H. Day. *Chemical Reviews*, v. 53, Oct. 1953, p. 167-189.

Describes synthesis, reactions, and properties. 82 ref.

1705* The Molecular Rotations of Polycyclic Compounds. II. Diterpenoids and Sesquiterpenoids. W. Klyne. *Chemical Society, Journal*, 1953, Oct., p. 3072-3081.

The general method of molecular-rotation differences is used to correlate the stereochemistry of the diterpenoids and some sesquiterpenoids with that of the triterpenoids and the steroids. Diagrams.

1706* On Terpenes. XLIII. Infrared Investigations of Terpenes. IV. (English.) J. Plíva, V. Herout, B. Schneider and F. Sorm. *Collection of Czechoslovak Chemical Communications*, v. 18, no. 4, Aug. 1953, p. 500-511.

Infra-red spectra of cadinanes, tetrahydroisozingiberene, and calacorane show that these hydrocarbons differ from each other merely in their spatial configuration. Tables, graphs. 22 ref.

1707* Surfactants in Ointment Bases. *Drug & Cosmetic Industry*, v. 73, Nov. 1953, p. 622-623.

Presents case for non-ionic emulsifiers.

1708 The Oxidation of Hydrocarbons. II. Examination of the Products of the Vapour Phase Oxidation of *n*-Heptane and of Methylcyclohexane. F. H. Garner, R. Long, and R. G. Temple. *Faraday Society, Transactions*, v. 49, Oct. 1953, p. 1193-1197 + 1 plate.

Includes tables, photographs. 10 ref.

1709 Elastic and Viscous Properties of Dilute Solutions of Polymethyl Methacrylate in Organic Liquids. B. A. Toms and D. J. Strawbridge. *Faraday Society, Transactions*, v. 49, Oct. 1953, p. 1225-1232.

Investigation was made into variability and interconnections of viscosity coefficient, stress relaxation time, and rate of strain relaxation time. These constants characterize behavior of a dilute solution of highly polymerized methyl methacrylate in a simple shearing motion at small rates of strain. Tables, graphs. 7 ref.

1710* Raney Nickel Reductions. III. Reduction of Anthraquinone and Its Derivatives. V. Ramanathan, B. D. Tilak, and K. Venkataraman. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Aug. 1953, p. 161-175.

Includes 24 ref.

1711 An Infra-Red Study of the *cis*- and *trans*-Isomers of Some C_{18} Fatty Acids. N. H. E. Ahlers, R. A. Brett, and N. G. McTaggart. *Journal of Applied Chemistry*, v. 3, Oct. 1953, p. 433-443.

A detailed quantitative study was made of the infra-red spectra between 2.5 and 15.0 μ of 19 fatty acids, including mono- and poly-unsaturated acids, conjugated and non-conjugated. Table, graphs. 35 ref.

1712 The Chemical Composition of High-Boiling Fractions of Coal Tar. I. A Steam Distillate From a Vertical-Retort Soft Pitch. A. S. Harris, E. N. White, and D. McNeil. *Journal of Applied Chemistry*, v. 3, Oct. 1953, p. 443-451.

A neutral oil boiling above 380 C at 760 mm., obtained from a soft vertical-retort coal-tar pitch, was separated by chromatography into paraffin waxes, fluorescent oils, solids, and brown residual oils. Tables, diagrams. 19 ref.

1713 The Production and Commercial Possibilities of Diphenic Acid. R. E. Dean, E. N. White, and D. McNeil. *Journal of Applied Chemistry*, v. 3, Oct. 1953, p. 469-476.

Diphenic acid was obtained by oxidation of phenanthrene. Alkyl esters and alkyd resins were prepared from the diphenic acid. The resins had properties comparable with those of phthalic alkyds. Graphs, table. 20 ref.

Chemistry—Organic

1714 Molecular Cross Sections in Films of Fatty Acids on Water. J. J. Kipling and A. D. Norris. *Journal of Colloid Science*, v. 8, Oct. 1953, p. 547-551.

Discusses the lack of cylindrical symmetry of the parraffin hydrocarbon and necessity of considering this in packing of long-chain fatty acids in monolayers on aqueous substrates. Diagrams, photographs. 6 ref.

1715* The Reciprocal Effect Between Synthetic Polymers and Detergents. (German.) Shuji Saito. *Kolloid-Zietschrift*, v. 133, no. 1, Oct. 1953, p. 12-16.

Viscosimetric tests made with polyvinyl alcohol; polyvinyl acetate; and anionic, cationic, and nonionic detergents show the effect depends on the nature of the detergent and is similar to the effect on protein. Graphs. 26 ref.

1716* Silicones—Their Chemistry and Application. G. R. Whalley. *Laboratory Practice*, v. 2, Nov. 1953, p. 597-600.

Describres production of silicones by the Grignard reaction. Discusses applications in greases, rubbers, and resins.

1717* Perfumery and Essential Oils. *Manufacturing Chemist*, v. 24, Nov. 1953, p. 478-481.

Reviews 1953 literature. Table, photograph. 25 ref.

1718 Synthesis of Petrochemicals. IV. Phenol, Acetone From Cumene. Arch L. Foster. *Petroleum Engineer*, v. 25, Nov. 1953, p. C3-C4.

Discusses rapid growth of phenol demand giving bright outlook for synthetic product and new process. Table, photographs.

1719 Petrochemical Process Handbook. *Petroleum Refiner*, v. 32, Nov. 1953, p. 97-195.

Includes "Synthetic Detergents", Foster D. Snell; "Synthetic Rubber", Clayton F. Ruebensaal; "Fertilizers", George Wash; "Synthetic Fibers", Frank J. Soday; "Plastics and Resins", Raymond B. Seymour; and "Pesticides", Lea S. Hitchner. Details of processing aliphatic, aromatic, and inorganic products are presented. Diagrams, graphs. 6 ref.

1720* Improvement of Montana Wax. J. Obloj and St. Roeffler. (Polish.) *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 498-503.

Discusses second extraction of wax with organic solvents to reduce the content of resins to 15%, refinement, oxidation, and further esterification of acid waxes obtained during refinement. Tables, graphs, micrographs.

1721* Phase-Equilibrium State of the System Liquid-Vapor for Real Two-Component Mixtures. I. Terpenes. (Polish.) M. Bukala, J. Majewski, and W. Rodzinski. *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 513-520.

By using two-tray apparatus, curves of equilibrium and of composition, as well as the coefficients of activity of α- and β-pinene mixtures have been determined. Graphs, photographs, tables. 15 ref.

1722* Thermochemical Investigations on Arylethenes. II. Heats of Combustion of Some Para and Orthotolylethenes and Phenylbutadienes. (English.) J. Coops, G. J. Hoijtink, Th. J. E. Kramer, and A. C. Faber. *Recueil des travaux chimiques des Pays-Bas*, v. 72, nos. 9-10, Sept.-Oct. 1953, p. 765-773.

Includes tables. 19 ref.

1723* Thermochemical Investigations on Arylethynes. I. Heats of Combustion of Some Diarylethynes. (English.) J. Coops, G. J. Hoijtink, Th. J. E. Kramer, and A. C. Faber. *Recueil des travaux chimiques des Pays-Bas*, v. 72, nos. 9-10, Sept.-Oct. 1953, p. 781-784.

Includes tables. 8 ref.

1724* Thermochemical Investigations on Arylethanes. I. Heats of Combustion of Phenylethanes. (English.) J. Coops, D. Mulder, J. W. Dienske, and J. Smittenberg. **II. Heats of Combustion of Some Para and Ortho Tolylethanes and Phenylbutanes.** J. Coops, G. J. Hoijtink, and Th. J. E. Kramer. *Recueil des travaux chimiques des Pays-Bas*, v. 72, nos. 9-10, Sept.-Oct. 1953, p. 785-797.

Includes tables. 21 ref.

1725* The Polarographic Reduction of Conjugated Hydrocarbons. III. Comparison of Various M.O. Approximations With Experimental Half-Wave Potentials of Alternant Hydrocarbons. (English.) G. J. Hoijtink and J. Van Schooten. *Recueil des travaux chimiques des Pays-Bas*, v. 72, nos. 9-10, Sept.-Oct. 1953, p. 903-908.

Includes graph, tables. 16 ref.

1726* Detergents' Effect on Skin. *Soap and Sanitary Chemicals*, v. 29, Nov. 1953, p. 44-46, 174.

Presents results of investigations to determine effects of soaps and synthetic detergents on skin. Tables, photograph.

1727* Some Observations on the Reaction of Modified Keratine With Nitroprusside. O. Ripa. *Textile Research Journal*, v. 23, Nov. 1953, p. 776-782.

Includes diagrams. 29 ref.

1728* The Reaction Between Styrene and Unsaturated Fatty Acids. I. Reaction Between Styrene and Sorbic Acid. S. Kut. *Paint and Varnish Production*, v. 43, Nov. 1953, p. 28-33, 82.

Describes work carried out as part of an investigation into the formation and structure of styrenated drying oils. Tables, graphs. 45 ref.

1729* Mechanism of Hydrocarbon Oxidation in the Gaseous Phase. II. Degradation-Splitting Character of Propylene Oxidation. (Russian.) S. S. Poliak and V. Ia. Shtern. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 5, May 1953, p. 631-639.

Acetaldehyde was found to be the substance which controls the reaction. Diagram, tables. 5 ref.

1730* Kinetics of Hydrogenation of Styrene on a Stationary Catalyst. (Russian.) E. A. Stoliarov and O. M. Todes. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 3, Mar. 1953, p. 370-378.

Studies have shown that hydrogenation on a stationary catalyst is a more complex process than on a powder catalyst. Table, graph. 18 ref.

1731* Cryoscopic Investigation of the Naphthalene-Iodine-Mercuric Iodide System. I. Cryoscopic Investigation of the Naphthalene-Iodine- Mercuric Chloride System. II. (Russian.) P. A. Smirnov. *Zhurnal Obshchei Khimii*, v. 23, no. 7, July 1953, p. 1085-1092.

Includes tables. 12 ref.

Books and Miscellaneous Publications

1732 Organic Chemistry. An Advanced Treatise. v. IV. Henry Gilman, editor. 1245 p. 1953. John Wiley & Sons, Inc., New York. (QD251 G42o)

Includes chapters on "The Terpenes", Richard H. Eastmand and Carl R. Noller; "Heterocyclic Chemistry", Richard H. Wiley; "Starch", W. Z. Hassid; "Chemistry of Explosives", George F. Wright; "Reactions of Organic Gases Under Pressure", W. H. Hanford and D. E. Sargent; and "Oxidation Processes", William A. Waters.

See also:
1510 (production of organic acids)
2203 (siloxanes as antifoam additives to lubricating oils)
2720 (thermal conductivities of organic liquids)

CHEMISTRY—PHYSICAL

1733 Formation, Stability and Crystal Structure of Solid Silicon Monoxide. Michael Hoch and Herrick L. Johnston. *American Chemical Society, Journal*, v. 75, Nov. 5, 1953, p. 5224-5225.

Includes diffraction pattern and table. 9 ref.

1734 Chemical Methods for Separating and Determining Metals Contained in Platiniferous Materials. Raleigh Gilchrist. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1617-1621. 25 ref.

1735* Dielectric Breakdown of Sulfur Hexafluoride in Nonuniform Fields. C. N. Works and T. W. Dakin. *Com-*

munication and Electronics, 1953, Nov., p. 682-687; disc., p. 687-689.

Includes graphs.

1736* Refraction of Hydrogen Bonds. (Russian.) G. B. Bokii and S. S. Batsanov. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1179-1180.

Compares refractions of H bonds with Al and corresponding K salts. Tables. 14 ref.

1737* Isotherm and Heat of Adsorption of Methyl Alcohol on Carbon Black. (Russian.) N. N. Avgul, O. M. Dzhigit, A. V. Kiselev, and K. D. Shcherbakova. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1185-1188.

Adsorption heat of vapors of methyl alcohol on "sferon-6" was measured. Table, graphs. 8 ref.

1738* Investigation of Structuring Process of Solutions by Method of Study of Their Elastic and Viscous Properties. (Russian.) I. A. Dumanskii, A. V. Dumanskii, and L. V. Khailenko. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1189-1191.

Solutions of gelatin, cellulose xanthogenate, synthetic latex, glycerin, and mixture of transformer oil with resin were studied. Graphs. 6 ref.

1739 The Heats of Mixing of Some Aromatic Hydrocarbons and Phthalates. *Faraday Society, Transactions*, v. 49, Oct. 1953, p. 1133-1139.

Experimental studies were made and used to estimate heats of mixing at constant volume. Tables, graphs. 30 ref.

1740* Studies in Colloid Optics. III. Sol-Gel Transition of Some Lyophobic Gels. P. K. Katti. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Aug. 1953, p. 148-160.

Studies mechanism of the sol-gel transition and the various processes leading to the growth of the colloid particles. Graphs, tables. 5 ref.

1741 Behavior of Ion Exchange Resins in Solvents Other Than Water. Swelling and Exchange Characteristics. George W. Bodamer and Robert Kunin. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2577-2580.

Includes tables.

1742 Equilibria Between Aromatic Acids and Weak Base Anion Exchangers. Sigfred Peterson and Elmer Gowen. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2584-2586.

Isotherms were measured for benzoic acids in a wide range of acid strengths in equilibrium with the weak base resins "Amberlite IR-4B" and "IR-45" at 30.3 C. Table, graphs. 11 ref.

1743 Correlation of the Solubilities of Gases in Low-Vapour-Pressure Liquids by an Evaporation Analogy. I. Theory. G. Burrows. **II. The Solubility of Helium in Some Low-Vapour-Pressure Liquids.** G. Burrows and F. H. Preece. **III. Some Applications of the Theory Developed in Part I.** G. Burrows. *Journal of Applied Chemistry*, v. 3, Oct. 1953, p. 451-462.

Part I discusses similarity between evolution of gas from a liquid and evaporation of vapor from a pure liquid. Part II describes experiments for determining the solubilities of He in three low-vapor-pressure liquids. Part III applies theory of part I to the solubilities of air in a variety of petroleum oils, ranging from heavy lubricating oils to aircraft fuels.

1744 Some Unsolved Problems of Liquids and Solutions. Robert L. Scott. *Journal of Chemical Education*, v. 30, Nov. 1953, p. 542-549.

Discusses vapor pressure-temperature relations, critical phenomena, models for liquids, "regular" solutions, fluorocarbon solutions, and solutions of polar substances. Graphs. 42 ref.

1745 Investigation of Complex Metal Ions by the Polarographic Method. Karl H. Gayer, Anita Demmler, and Michael J. Elkind. *Journal of Chemical Education*, v. 30, Nov. 1953, p. 557-561.

Discusses fundamental theory and applications. Graphs, tables.

1746 Dissociation, Chemical Exchange, and the Proton Magnetic Resonance in Some Aqueous Electrolytes. H. S. Gutowsky and A. Saika. *Journal of Chemical Physics*, v. 21, Oct. 1953, p. 1688-1694.

Describes experimental procedure used in evaluating the above. Graphs, table. 18 ref.

1747 The Surface Viscosity of Detergent Solutions as a Factor in Foam Stability. A. G. Brown, William C. Thuman, and J. W. McBain. *Journal of Colloid Science*, v. 8, Oct. 1953, p. 491-507.

Surface viscosity data were obtained with a group of detergents and detergent mixtures specially selected to illustrate the role of surface viscosity in the stability of foams. Tables, graphs, diagrams. 22 ref.

1748 Transfer of Air Through Adsorbed Surface Films as a Factor in Foam Stability. A. G. Brown, William C. Thuman, and J. W. McBain. *Journal of Colloid Science*, v. 8, Oct. 1953, p. 508-519.

Data are presented for a selected group of pure detergents and detergent mixtures. Factors affecting the interpretation of the data in terms of foam stability are discussed. Tables, graphs, diagram. 9 ref.

1749 Effect of Electrolytes on the Rate of Surface Tension Lowering; the Rate of Surface Equilibrium Attainment as a Factor in Detergency. Emil J. Burcik. *Journal of Colloid Science*, v. 8, Oct. 1953, p. 520-528.

Includes graphs, table. 13 ref.

1750 Effect of Magnetic Fields on the Rheology of Ferromagnetic Dispersions. Edmund N. Harvey, Jr. *Journal of Colloid Science*, v. 8, Oct. 1953, p. 543-547.

Correlates the strengths of attractive forces between flocculant particles in nonaqueous media with outward manifestation of these forces. Graphs, table. 3 ref.

1751 Electromigration in a Cation-Exchange Resin. III. Correlation of Self-Diffusion Coefficients of Ions in a Cation-Exchange Membrane to Its Electrical Conductance. K. S. Spiegler and C. D. Coryell. *Journal of Physical Chemistry*, v. 57, Oct. 1953, p. 687-690.

Coefficients for sodium, zinc, and calcium ions in "Nepton CR-51" membranes were determined by radio-tracers. Values agree fairly well with earlier work but calcium shows some anomalies. Tables, graph. 14 ref.

1752* Research on Adsorption Process in Absorbant Layers With Linear Adsorption Isotherms. (German.) Claes Gustaf Allander. *Kungl. Tekniska Högskolans Handlingar* (Transactions of the Royal Institute of Technology, Stockholm, Sweden), 1953, no. 70, 160 p. (T4 K96t).

Experimental data confirm various assumptions and theories. Graphs, tables, diagrams. 92 ref.

1753* The Viscosity and the Conductance-Viscosity Product of Electrolyte Solutions in Bromine. M. John Rice, Jr. and Charles A. Kraus. *National Academy of Sciences of the United States of America, Proceedings*, v. 39, Nov. 1953, p. 1118-1124.

Includes graphs, tables. 6 ref.

1754 Experiments on the Deposition of Iodine 131 Vapour Onto Surfaces From an Airstream. A. C. Chamberlain. *Philosophical Magazine*, v. 44, 7th ser., no. 357, Oct. 1953, p. 1145-1153.

Reports that desposition was controlled by diffusion accross laminar layer of air flow over surfaces and was governed by same laws as diffusion of heat in forced convection. Tables, graphs. 5 ref.

1755* Calculations of the Heat of Adsorption of Hydrogen on Platinum. (English.) W. M. H. Sachtler. *Recueil des travaux chimiques des Pays-Bas*, v. 72, nos. 9-10, Sept.-Oct. 1953, p. 897-898.

Calculations from Beeck's velocity constant and experimental results show good agreement. 10 ref.

Chemistry—Physical

1756 Melting and Crystal Structure. The Mechanism of Melting of Group I Nitrates. W. J. Davis, S. E. Rogers, and A. R. Ubbelohde. *Royal Society, Proceedings*, v. 220, ser. A, Oct. 22, 1953, p. 14-24.

It is suggested that the low melting points of group I nitrates, compared with the corresponding halides, are due to the formation of association complexes in the nitrate melts. Graphs, tables. 40 ref.

1757 The Theory of Condensation of Supersaturated Vapours in the Absence of Ions. A. J. Barnard. *Royal Society, Proceedings*, v. 220, ser. A, Oct. 22, 1953, p. 132-141.

The Becker & Doring expression for critical supersaturation is compared with the cloud-chamber measurements of Volmer & Flood (1934), taking into account the rapid heating of the gas after the fast expension. Tables. 12 ref.

1758 Studies on the Discharge Reaction in Liquid Air. I. On the Discharge Reaction Products. (English.) Eizo Kanda and Yokan Nomura. **II. On the Thermal Secondary Reaction.** Yokan Nomura. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 1, Feb. 1953, p. 1-15.

Describes thermal reactions during discharge and reactions between the discharge reaction products during the rise of temperature after discharge.

1759* Equilibrium Conditions of Multicomponent Systems. V. (Russian.) A. V. Storonkin. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 5, May 1953, p. 617-623.

Calculations show effects of adding small amounts of a second phase which changes the composition of the major phase. 5 ref.

1760* Method for Calculating Electron Levels of Atoms Adsorbed on Crystal Surfaces. (Russian.) V. L. Bonch-Bruevich. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 5, May 1953, p. 662-673.

It is shown that the adsorbed aotms of alkaline metals and hydrogen have two types of bonding to adsorbant surfaces. The effects of chemosorption on electroconductivity can be predicted. 15 ref.

1761* Coefficient of Internal Diffusion in a Water-Phenol Medium. (Russian.) E. K. Mankash and A. B. Pakshver. *Zhurnal Prikladnoi Khimii*, v. 26, no. 8, Aug. 1953, p. 835-840.

Elongation of a polyamide fiber strengthens the intermolecular reaction between the amide bonds of adjacent molecules and hinders internal diffusion deep in the fiber. Tables, graphs. 3 ref.

See also:
1447 (surfactants in fertilizers)
2231 (electrical conductivity and density of molten cryolite)

COATINGS

1762 Corrosion and Plant Maintenance. Joe Rench. *American Oil Chemists' Society, oJurnal*, v. 30, Nov. 1953, p. 571-574.

Describes components of paint and characteristics of each ingredient justifying its use. Discusses application of paint in combating corrosion.

1763 Putty and Caulking Compounds. Harry Kelfer. *American Paint Journal*, v. 38, Nov. 9, 1953, p. 58, 60, 62, 64-66, 68, 70, 72, 74, 76, 78, 80, 82.

Presents advantages of caulking compounds and discusses compounding problems in detail. Photographs.

1764* Temperature Cycles of Enamelled Castings During the Process of Enamel Fusing. E. R. Evans. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Oct. 1953, p. 78-92 + 1 plate.

Temperature cycles were determined by means of a thermocouple attached to a test casting in the furnace. Diagrams, graphs, photographs, tables.

1765 Magnesium to the Fore. *Chemical and Engineering News*, v. 31, Nov. 16, 1953, p. 4778, 4781.

Briefly describes chemical surface treatments of Mg for resisting corrosion and abrasion. Also discusses experiments using Mg powder as fuel in internal combustion engines.

1766 Enamelling of Cast Iron. V. Montoro, E. Lossa, A. Guissani, and E. Guissani. *Fountry Trade Journal*, v. 95, Nov. 5, 1953, p. 579-581.

Discusses causes of enamel defects including slag and other inclusions, blow holes, rust, and gas evolution.

1767 Radiant Burners Improve Galvanizing Quality, Cut Costs. R. M. Breckenridge and K. E. Rasmussen. *Iron Age*, v. 172, Nov. 5, 1953, p. 168-171.

Describes design and applications of novel burner which lengthens life of galvanizing pots and cuts operating costs. Diagrams, graphs, photographs.

1768 Better Tank Construction Methods Increase Lining Life. Manson Glover. *Iron Age*, v. 172, Nov. 5, 1953, p. 178-182.

Describes techniques to be observed to insure close, permanent bond between rubber or plastic lining and shell. Photographs, diagrams, table.

1769* Phenolic Modified Rosin for Oil Varnishes. H. H. Mathur and J. S. Aggarwal. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Sept. 1953, p. 411-413.

Resins were prepared by condensing cashew nut shell liquid or bhilawan nut shell liquid with rosin. The properties of oil varnishes prepared from these resins were investigated. Table. 14 ref.

1770 Porosity of Sprayed Coatings. D. de Paauw. *Electroplating and Metal Finishing*, v. 6; *Metal Spraying*, v. 3, Nov. 1953, p. 435-436, 438.

Deals with the origin and effect of porosity in sprayed metal coatings, its measurement, and the effect of operating variables. Tables. (To be continued.)

1771 Substituted Silyl Derivatives of Starch. R. W. Kerr and K. C. Hobbs. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2542-2544.

Mono- and bi-functional silanes were reacted with starch to form products useful as plastics and coatings. 3 ref.

1772 Deterioration of Alkyd Resin Films. Emerson B. Fitzgerald. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2545-2548.

Carefully measured films baked on glass panels were exposed to light in an atmosphere of oxygen. Evolved gases were analyzed. Ultraviolet light effected the surface, while visible light dehydrogenated deeper areas. Photograph, table, graphs. 8 ref.

1773 Chemistry of Wash Primers. Harold Rosenbloom. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2561-1568.

Shows that the 3 ingredients: phosphoric acid, "Vinylite" XYHL, and zinc chromate are required for good adhesion. Certain variations are described. Table, graphs. 8 ref.

1774* Progress in Organic Finishes 1948-1953. B. F. Ames. *Industrial Finishing*, v. 30, Nov. 1953, p. 38-40, 42, 44, 46.

In the last five years, a number of conditions have arisen, which have placed new demands on manufacturers of metal, wood, and plastic products. Problems springing from these conditions are covered.

1775* Ten Years of Progress in Industrial Finishes. Wayne R. Fuller. *Industial Finishing*, v. 30, Nov. 1953, p. 56-58, 60, 62, 64, 66, 70.

Forward steps have been so numerous and diversified that the resulting advancement is truly impressive.

1776 Flame-Plating Protects Parts From Wear. *Machine and Tool Blue Book*, v. 49, Nov. 1953, p. 209-210, 212-214.

A method of applying thin metallic coatings on metal parts and its applications are discussed. Photographs, diagrams, graph.

1777 Some Mechanical Properties of Paint Films. Adolf C. Elm. *Official Digest. Federation of Paint and Varnish Production Clubs*, 1953, no. 346, Nov., p. 751-774.

Discusses effects of temperature, humidity, and pigment particle size and shape on structure and strength. Graphs, photographs, tables. 13 ref.

1778* Glossmeter Design and Gloss Standards. A. D. Newell, et al. *Official Digest. Federation of Paint and Varnish Production Clubs*, 1953, no. 346, Nov., p. 775-780.

Describes apparatus and use of instrument for measuring sharpness-of-image gloss.

1779* A Study of the Spontaneous Combustion Tendencies of Paint Vehicles. Charles M. Jackson, et al. *Official Digest. Federation of Paint and Varnish Production Clubs*, 1953, no. 346, Nov., p. 781-786.

States that unbodied oils are more thermally reactive than those subjected to polymerization in the kettle or when incorporated into an alkyd or varnish. Graphs.

1780 Observations on the Optical Properties of Pigmented Films. R. H. Kienle and C. Maresh. *Oil & Colour Chemists' Association, Journal*, v. 36, Nov. 1953, p. 619-643; disc., p. 643-645.

Discusses influence of pigment properties on the optical properties of protective coatings. Micrographs, diagrams. 10 ref.

1781 A Bibliography of Publications on Industrial Protective Coatings. *Organic Finishings*, v. 14, Oct. 1953, p. 11-13, 16, 18-25.

An annotated list of material published in the U. S. since 1940 and currently in print. Divided into 24 sections.

1782 Dispersible Pigment Powder. W. Carr. *Paint Manufacture*, v. 23, Nov. 1953, p. 363-365, 379.

Discusses organic pigments in a water paste form as distinct from a dry powder form and the need for a dispersable pigment powder at a reasonable price. Photograph.

1783 The Determination of Particle Size. I. N. Corcoran. *Paint Manufacture*, v. 23, Nov. 1953, p. 366-368.

Stresses the fact that two paints can be identical in chemical analysis yet differ in quality, solely because of particle size differences. Diagram, photograph. (To be concluded.)

1784 Report on Pigment Progress. W. M. Morgans. *Paint Manufacture*, v. 23, Nov. 1953, p. 369-372, 379.

Specifications of methods and analyses covering pigments and extenders and a review of the newer types of colloid mills and disintegrators are noted. Photographs. 37 ref.

1785 A New Photo-Electric Method of Determining the Toning Power of White Pigments. *Paint Manufacture*, v. 23, Nov. 1953, p. 373-379.

Brief summary of a method described by W. Grassman and H. Clausen in *Deutsche Farben-Zeit.*, v. 7, 1953, no. 6, p. 211-215. Photograph, table.

1786 Varnish and Paint Production at the I.C.I. Slough Works. *Paint Manufacture*, v. 23, Nov. 1953, p. 376-378.

Describes operations of the Paints Div. of the Imperial Chemical Industries, Ltd. Photographs. (To be concluded.)

1787 Reflectivity of Aluminum Pigments and Paint. II. F. B. Rethwisch, G. M. Babcock, and E. C. Riggs. *Paint, Oil, & Chemical Review*, v. 116, Nov. 19, 1953, p. 22, 24.

Presents results of experimental studies on pigments from coarsest to finest, both paste and powder form. Results are a function of vehicle characteristics, pigment concentration, and spraying technique. Tables.

1788 The Protectometer and the Evaluation of Anti-Corrosive Primers. M. A. Danforth, K. H. E. Larson, and Wouter Bosch. *Paint, Oil & Chemical Review*, v. 116, Nov. 5, 1953, p. 48-52, 54, 56-57.

Describes an electrochemical device and its applications in predicting life of protective coatings. Diagrams, photographs, tables. 14 ref.

1789 Solvency Characteristics of Low Odor Type Thinners. *Paint, Oil & Chemical Review*, v. 116, Nov. 5, 1953, p. 44-46.

A study was made on viscosities resulting from high and low solvency thinners with various resins. Tables, graphs.

1790 The Pigmentation of Emulsion Systems. *Paint, Oil & Chemical Review*, v. 116, Nov. 5, 1953, p. 57-58, 60-64.

A study was made on the effect of preparation variables on the properties of latex paints. Tables.

1791 A Comparison of Alkyd Flat, Latex, and Other Interior Wall Paints. *Paint, Oil & Chemical Review*, v. 116, Nov. 5, 1953, p. 66, 68-70, 72.

Alkyd and latex paints were evaluated and compared with older types. Tables.

1792 Curing Agents for Epoxy Resins. *Paint, Oil & Chemical Review*, v. 116, Nov. 5, 1953, p. 72-73, 75-80.

Air-dried and baked coatings were studied. Urea and phenolic resins gave best results. Polyamide resins were found to have good properties. Tables. 10 ref.

1793 Air Drying Polysulfide Rubber Paint Films. J. R. Panek, J. S. Jorczak, H. Colon. *Paint, Oil & Chemical Review*, v. 116, Nov. 19, 1953, p. 30, 32-34, 43.

Physical properties are discussed. Special applications are suggested. Tables, graphs.

1794* Quality Control in the Paint Industry. I. Fundamental Basis of Statistical Control. Lawrence Statkin. *Paint and Varnish Production*, v. 43, Nov. 1953, p. 25-27, 74.

Quality control in the paint industry can be applied to the raw materials, work-in-process, and finished goods. Table. 8 ref.

1795* Aqueous Industrial Enamels. A New Technology in Baked Finishes. Herbert Hoenel. *Paint and Varnish Production*, v. 43, Nov. 1953, p. 43-40.

Discusses progress on experimental work. 29 ref.

1796* Testing Organic Finishes and Interpretation of Results. C. O. Hutchinson. *Plating*, v. 40, Nov. 1953, p. 1255-1266; disc., 1266-1268.

Describes over sixty properties of organic finishing materials as a basis of evaluating coatings. Lists standard tests for most of these properties. Tables. 141 ref.

1797* Applications of Barrel Enamelling. W. S. Field. *Product Finishing*, v. 6, Oct. 1953, p. 52-55.

Discusses field of application and costs. Photographs.

1798* Recent Developments in Protective Coatings. Bright Plating Protection. *Product Finishing*, v. 6, Oct. 1953, p. 77-78.

Discusses removal of rinse water and prevention of finger prints and discoloration.

1799* Porcelain Enameling Steel Pipe. *Products Finishing*, v. 18, Nov. 1953, p. 69-70, 74.

Describes operation of dipping and drying machine. Photograph.

1800* Protective Ceramic Coatings Versus the Corrosive Effects of Exhaust-Gas. Michael Lorant. *Refractories Journal*, v. 29, Oct. 1953, p. 418-420.

Describes tests of ceramic coatings on heat resistant alloys. Specimens were exposed to lead bromide vapors at temperatures of 1350 to 1650 F.

1801* Phosphatizing Steel Wire in Wire Mills. (German.) Hans Berkenhoff. *Stahl und Eisen*, v. 73, no. 22, Oct. 1953, p. 1391-1394.

Discusses experiences in bonderizing wire. Describes industrial procedure and prospects for use in the wire manufacturing industry. 11 ref.

1802* Surface Layers of High Melting Titanium Compounds. (German.) A. Münster and W. Ruppert. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, p. 564-571.

Describes methods of applying films of titanium nitride and

Coatings

titanium carbide on iron. Discusses the reaction mechanisms and outlines study of macroscopic properties and microscopic structures of these films. Micrographs, graph. 13 ref.

1803* Problems of Bright Tinning. (Russian.) G. I. Chufarov, M. G. Zhuravleva, E. P. Tatievskaia, B. D. Overbukh, and V. K. Antonov. *Zhurnal Prikladnoi Khimii*, v. 26, no. 6, June 1953, p. 652-655.

Boiling point of flux is an important characteristic which varies with the water content. Tables, graphs.

See also:
1685 (metals in phosphating solutions)
1713 (varnishes containing resins of diphenic acid)
1728 (styrenated drying oils as surface coating materials)
1919 (preplating for hot galvanizing)
2220 (post-galvanizing installation for wire)
2245 (dross from galvanizing)
2760 (fire retardent castings)

CORROSION

1804 Relation of Bubble Structure of Porcelain Enamel to Fish-Scaling. C. G. Bergeron. *American Ceramic Society, Journal*, v. 36, Nov. 1953, p. 373-376.

Results indicate that the bubbles which were effective in inhibiting fish-scaling were contained approximately in the 1-mil layer of glass adjacent to the steel. Diagrams, micrographs, graphs. 5 ref.

1805 Symposium on Control of Internal Corrosion of Tankers. I. The Nature of Corrosion and Its Control. William B. Jupp. **II. Inhibitors in Cargo.** J. V. C. Malcolmson, W. S. Quinby, Gwendolyn D. Pingrey, and J. C. D. Oosterhout. **III. Corrosion Control in Practice.** A. B. Kurz. *Corrosion*, v. 9, Nov. 1953, p. 387-410; disc., p. 410-424.

Tables, graphs, diagrams. 13 ref.

1806 Cable Sheath Corrosion and Prevention. B. B. Reinitz. *Corrosion*, v. 9, Nov. 1953, p. 425-430; disc., p. 431.

Discusses causes of corrosion in lead sheaths and possibilities of prevention by means of cathodic protection and neoprene coverings. Photographs, diagrams, tables. 24 ref.

1807 Radiography as an Aid in Corrosion Studies. H. A. Liebhafsky and A. E. Newkirk. *Corrosion*, v. 9, Nov. 1953, p. 432-435.

The X-ray technique was used to determine corrosion on three types of stainless steel by ferric chloride solution. Radiographs.

1808 Some Corrosion Hazards from DC Welding Currents. H. W. Wahlquist. *Corrosion (News Section)*, v. 9, Nov. 1953, p. 1.

Discusses methods of connecting welding machines to large construction projects to eliminate or reduce corrosion or pitting on adjoining structures. Diagrams.

1809* Influence of Temperature on Rate of Corrosion of Aluminum and Certain Aluminum Alloys. (Russian.) G. V. Akimov and V. V. Romanov. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 281-283.

Tests were made on Al-Cu alloys, Al-Mg alloys, and commercially pure Al. Graphs. 3 ref.

1810* New Principle in the Investigation of Atmospheric Corrosion of Metals. (Russian.) I. L. Rozenfel'd and T. I. Pavlutskaia. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 315-317.

Presents a hypothesis on the possibility of the existence of corrosion elements having considerable differences in potential. Graphs.

1811 The Rate of Dissolution of Zinc and Cadmium in Chromic Chloride Solutions. Cecil V. King and Natalie Mayer. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 473-479.

Discusses experimental study of factors affecting the above including form of chromic ion present, pretreatment of metal surface, and in some solutions, acidity. Graphs, table. 15 ref.

1812 Corrosion. Mars G. Fontana. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 91A-92A, 94A.

Describes anomalies of galvanic couple of Al and stainless steel in strong HNO_3. Photograph, table, graphs.

1813 Some Observations on the Mechanism of Pitting Corrosion. R. May. *Institute of Metals, Journal*, v. 82, Oct. 1953, p. 65-74.

Discusses nature of corrosion products, causes, and controlling factors using copper specimens. Diagrams.

1814* Observations on Three Non-Tarnishing Ferrous Alloys. A. A. Krishman. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Sept. 1953, p. 451-453.

Presents results of corrosion tests on Fe-Al-Mn alloys. Micrographs, tables.

1815 Three Accelerated Corrosion Tests for Materials and Finishes. Sam Tour. *Materials & Methods*, v. 38, Nov. 1953, p. 110-113.

Describes equipment and methods for making simulated service tests. Includes testing by alternate condensation, wear-corrosion, and salt water. Photographs.

1816* Corrosion of Lead. Dissolution as a Function of Time. (German.) W. Katz. *Metalloberfläche*, Ausgabe A, v. 7, no. 11, Nov. 1953, p. 161-166.

Reports results of experiments with neutral, acid, and alkali solutions. Details of the experiments are described. Results are compared with those from electrochemical measurements. Graphs, micrographs. 5 ref.

1817 Corrosion. How Best to Study It. *Metal Progress*, v. 64, Dec. 1953, p. 100, 170, 172-174.

Includes "For More Fundamental Research", John Chipman and "A Defense of Ad Hoc Studies", Frank L. LaQue. Discusses relative merits of fundamental and empirical studies.

1818 Corrosion Tests for Liquid Metals, Fused Salts at High Temperatures. D. C. Vreeland, E. E. Hoffman, and W. D. Manly. *Nucleonics*, v. 11, Nov. 1953, p. 36-39.

Describes static and dynamic tests used to determine reactions between possible heat-transfer and container materials for nuclear applications.

1819 Structures in the Sea. M. B. Willey. *Petroleum Engineer*, v. 25, Nov. 1953, p. B38, B41, B43-B44, B47.

Shows how wind, waves, and corrosion presents special problems in design of off-shore drilling platforms. Photographs. 7 ref.

1820 Corrosive Action on Steel by Gases Dissolved in Water. J. Wade Watkins and Jack Wright. *Petroleum Engineer*, v. 25, Nov. 1953, p. B50-B51, B53, B55, B57.

Equipment corrosion in secondary recovery of petroleum was shown to be accelerated by action of gases dissolved in injected water. Photograph, graphs, diagram. 8 ref.

1821* Conditioning Engine Exhaust Gas for Injection Into Oil Reservoirs. J. N. Breston, R. C. Neal, H. J. Bohne, and J. C. Waterman. *Producers Monthly*, v. 17, Apr. 1953, p. 72-82.

Presents a comprehensive analysis of the corrosivity of combustion gasses and the possible methods of preventing or eliminating such properties. Diagrams, graphs, photographs, tables. 12 ref.

1822* Study of the Oxidation of High-Purity Iron and the Manner of Decomposition of the Monoxide Phase of Iron. (French.) R. Collongues, R. Sifferlen, and G. Chaudron. *Revue de metallurgie*, v. 60, no. 10, Oct. 1953, p. 727-735; disc., p. 735-736.

Discusses structure of oxide films. Role of impurities in the mechanism of oxidation is described. Various mechanisms of the decomposition of the iron oxide phase are indicated. Graphs, micrographs. 11 ref.

1823* Electrode Polarization and Its Utilization in the Evaluation of Inhibitors. (Italian.) G. Bombara. *Rivista dei Combustibili*, v. 7, no. 9, Sept. 1953, p. 527-546.

Discusses causes of electrochemical differentiation of a metallic

surface into anodic and cathodic areas. Diagrams, graphs. 6 ref.

1824 Corrosion Studies at the Institute. *Tin and Its Uses*, 1953, no. 29, p. 1-5.

Discusses corrosion resistance of tin and its alloys to sea water and weathering conditions. Photographs.

1825* The Behavior of Alkali Hydrogen Fluorides. The Hydrogen Fluoride Mixture "WB," in the Presence of Iron. (German.) Bruno Schulze. *Werkstoffe und Korrosion*, v. 4, no. 10, 1953, p. 349-356.

Describes experiments and results on corrosive effects of potassium acid fluoride and ammonium acid fluoride on iron at 20 and 80 C. Graphs, photographs, tables. 12 ref.

1826* Kinetics of High-Temperature Oxidation of Selenium Bearing Copper. (Russian.) N. P. Diev, M. J. Kochnev, A. F. Plotnikova, and T. N. Zaidman. *Zhurnal Prikladnoi Khimii*, v. 26, no. 6, June 1953, p. 596-604.

It was established that the addition of Se to Cu alloys increases oxidation rate in the temperature range of 600-1000 C. Diagrams, graphs, tables. 12 ref.

1827* Corrosion of Iron in Contact With Gasoline or Kerosene and With an Aqueous Solution of an Electrolyte Containing Potassium Chromate Additives. (Russian.) I. V. Krotov and T. M. Khachadurova. *Zhurnal Prikladnoi Khimii*, v. 26, no. 6, June 1953, p. 605-611.

Potassium chromate can be used as a corrosion inhibitor only when the water phase is a very weak electrolyte. Tables, graphs. 6 ref.

1828* Factors Influencing the Rusting of Precision Steel Parts During Manufacturing Process. (Russian.) V. V. Skorchelletti and V. E. Piskorskii. *Zhurnal Prikladnoi Khimii*, v. 26, no. 7, July 1953, p. 730-735.

Influence of relative humidity, temperature, and contact with air containing SO_2 on rate of rust spot generation was demonstrated by laboratory experiments. Graphs.

1829* Mechanism of Dissolution for Copper in Nitric Acid in the Presence of Certain Inhibitors. (Russian.) S. A. Balezin and G. S. Parfenov. *Zhurnal Prikladnoi Khimii*, v. 26, no. 8, Aug. 1953, p. 795-801.

Substances which disintegrate nitrous acid serve as inhibitors of the rate of Cu dissolution in nitric acid. Graphs, tables. 9 ref.

Books and Miscellaneous Publications

1830 Water Treatment. Houseman & Thompson. 192 p. 1953. Stechert-Hafner, New York. (TJ379 H81s)

Scales, deposits, pitting, and corrosion with their analyses and the analyses of the waters that caused them.

See also:
1531 (protection of cermets from oxidation)
1612 (corrosion by melted phosphate)
2361 (intercrystalline corrosion of Al alloys)

ELECTRICAL ENGINEERING

1831* Rough Starting of Non-Synchronous Motors. (German.) K. P. Kovács. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 1-2, 1953, p. 187-216.

Discusses relationships to be considered in computing rough starting and indicates their derivation. Diagrams, graphs, tables.

1832* A New Electronic Analogue Computor. A Compact General-Purpose Instrument Designed for Quantity Production. E. Lloyd Thomas. *Aircraft Engineering*, v. 25, Nov. 1953, p. 349-353.

Includes graphs, diagrams, photographs.

1833* Maxwell-Wagner Loss and Absorption Currents in Dielectrics. B. V. Hamon. *Australian Journal of Physics*, v. 6, Sept. 1953, p. 304-315 + 1 plate.

Dielectric loss factors of a number of heterogeneous mixtures were measured at frequencies up to 3 mc. per sec. The mixtures consisted of an non-polar base material and small percentages of a slightly conducting solid or liquid "impurity." Diagrams, photomicrographs. 14 ref.

1834* A Generalized Account of Armature Reaction. G. H. Rawcliffe. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 7-11.

Rocking foreward of d.c. brushes and a lagging a.c. power factor tend to reduce the respective output voltage. Table, diagram.

1835* Impulse Voltage Generators. F. S. Edwards. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 12-21.

Defines the standard wave shapes used in impulse voltage testing. Gives an elementary theoretical treatment of the single stage circuit. Diagram. 12 ref.

1836* Some Useful Procedures in Circuit and Line Theory T. R. Walsh. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 24-28.

Discusses star for delta substitution, development of lattice section with series impedances, and current distribution along a transmission line considering successive reflections. Diagrams.

1837* Towards a Better Understanding of Push-Pull Circuits. M. H. N. Potok. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 29-33.

Discusses practical and theoretical considerations of push-pull power amplifiers. Diagrams, graphs. 6 ref.

1838* The Grouping of Cells for Maximum Current and Power. C. Hargreaves. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 34-36.

Discusses the obtaining of maximum current in a specified resistive load and the choice of two possible values of load which will absorb maximum power from a given grouping of cells.

1839* Use of Inversion for the Calculation of E. S. Fields Between Parallel Cylinders. E. Besag. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 40-44.

Conformal transformation is the most useful tool for the solution of two-dimensional field problems by mathematical analysis. Diagrams.

1840* The Initial Impulse Voltage Distribution on a Transformer Winding. E. R. Hartill. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 45-52.

Describes laboratory experiments which can be performed with the aid of an electrolytic tank to give a clearer picture of the principles involved. Diagram. 4 ref.

1841* Power System Transients. E. Openshaw Taylor. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 53-56.

Discusses causes, calculation, behavior, effects on plants, and protection against transients.

1842* Flux Plot of a Simple Transformer Bushing. W. K. Low. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 57-59.

Describes construction of tank model for simple low voltage indoor bushing. Diagrams.

1843* The Application of the Regenerative Method of Testing to Laboratory Work. J. V. Perry. *Bulletin of Electrical Engineering Education*, 1953, no. 10, p. 60-63.

Discusses Hopkinson test for d.c. machines and regenerative tests for transformers. Diagrams.

1844* Co-ordination of Ml and Nl Telephone Carrier Systems. E. P. Smith, L. P. Cornell, Jr., and M. G. Jerome. *Communication and Electronics*, 1953, Nov., p. 517-520.

Describes development of suppression device to prevent energy from the *Ml* open-wire carrier system disturbing channels of the *Nl* system. Diagrams, tables.

1845* The Electric Strength of Air in Nonuniform Fields at Radio Frequencies. J. B. Whitehead, D. L. Birx, and C. F.

Electrical Engineering

Miller. Communication and Electronics, 1953, Nov., p. 520-524.
Reports results of experimental studies in frequency range of 2.0 to 16.0 mc. per second. Diagram, graphs. 17 ref.

1846* Preliminary Development of a Magnettor Current Standard. E. P. Felch and J. L. Potter. *Communication and Electronics*, 1953, Nov., p. 524-531.
Describes experimental work and results. Discusses factors affecting accuracy to which current can be maintained. Diagrams, photographs, graphs, table. 9 ref.

1847* A Universal Meter for Measuring Voltages at High Impedances, Micromicroamperes, and Insulation Resistance. W. R. Clark, R. E. Watson, and G. C. Mergner. *Communication and Electronics*, 1953, Nov., p. 551-555.
Describes basic circuit and performance characteristics. Tables, photographs, diagrams. 2 ref.

1848* Forcing Function Generator Employing Conductive Plastic. L. W. Norman. *Communication and Electronics*, 1953, Nov., p. 576-581.
Use of a conductive-plastic potentiometer to provide a forcing-function signal for testing servo systems and components is described. Diagrams, photographs. 9 ref.

1849* Basic Concepts in the Analysis of Stationary Electric Circuits. D. W. Spence and C. R. Cahn. *Communication and Electronics*, 1953, Nov., p. 617-623; disc., p. 623-625.
Includes diagrams. 12 ref.

1850* Propagation Mechanism of Impulse Corona and Breakdown in Oil. T. W. Liao and J. G. Anderson. *Communication and Electronics*, 1953, Nov., p. 641-647; disc., p. 647-648.
Reports results of experimental studies in which data were obtained simultaneously with high-speed camera, still camera, and photocell, as well as current measuring devices, thus giving a correlated and clear picture of the breakdown process of oil. Diagrams, photographs, graphs. 18 ref.

1851* Correction of Frequency Errors in Wattmeters. James Robert Freeman. *Communication and Electronics*, 1953, Nov., p. 679-681; disc., p. 681-682.
Includes diagrams, graphs. 5 ref.

1852* Voltage Regulation of 12-Phase Double-Way Rectifiers. R. L. Witzke, J. V. Kresser, and J. K. Dillard. *Communication and Electronics*, 1953, Nov., p. 689-697; disc., p. 697.
Includes graphs, diagrams. 5 ref.

1853* The Effect of Minor Constituents in High Dielectric Constant Titanate Capacitors. W. W. Coffeen. *Communication and Electronics*, 1953, Nov., p. 704-709.
Discusses additives which cause a shift in temperature of the Curie peak and those which result in a depression of the Curie peak. $BaSnO_3$ and $PbSnO_3$ illustrate first group, and $MgSnO_3$, $Bi_2(SnO_3)_3$, $MgTiO_3$, and $CaTiO_3$, the second. Table, graphs. 13 ref.

1854* The Problem of Low Power Factor Air Conditioning. R. F. Scott. *Edison Electric Institute Bulletin*, v. 21, Aug. 1953, p. 313-314.
Electric companies will undoubtedly continue to install capacitors on their systems in amounts and at points dictated by engineering calculations and board studies.

1855* Power Factor Correction of Fractional Horsepower Motors. H. I. Miller. *Edison Electric Institute Bulletin*, v. 21, Aug. 1953, p. 317-318, 323.
Discusses problem of poor power factor of fractional horsepower motors, with particular reference to those installed in room air conditioners.

1856 Overload Relays and Circuit Breakers for Protecting Motorized Appliances and Their Branch Circuits. G. W. Heumann. *Electrical Engineering*, v. 72, Dec. 1953, p. 1056-1060.
Discusses causes of motor overheating. Describes thermal overload relays such as bimetal type and solder-film types. Suggests molded-case air circuit breakers for short-circuit protection. Photographs, graphs, diagrams, table.

1857 Mine-Trailing Cables. Steve Bunish. *Electrical Engineering*, v. 72, Dec. 1953, p. 1061-1065.
Condensed from "Construction and Maintenance of Mine-Trailing Cables" presented at AIEE dist. meeting. Sept.-Oct. 1953. Discusses construction, principal types of damage, and maintenance. Diagrams, photographs, tables.

1858 Frequency and Fluorescent Lamps. D. E. Spencer. *Electrical Engineering*, v. 72, Dec. 1953, p. 1066-1070.
Describes more economical and efficient operation of fluorescent lamps on higher frequencies. Diagrams, tables, graph. 9 ref.

1859 Modern Forced-Air Cooling of Power Transformers. W. D. Albright. *Electrical Engineering*, v. 72, Dec. 1953, p. 1071-1075.
Available types of forced-air fans and control methods, application to power transformers, and advantages of each type for specific installation are discussed. Graph, photographs, table. 2 ref.

1860 Economic Factors of Small-Capacity Hydroelectric Stations. H. H. Brown and A. R. Klann. *Electrical Engineering*, v. 72, Dec. 1953, p. 1083-1088.
Condensed text of paper presented at the AIEE Summer General Meeting, June 1953. Use of induction generators in semi-outdoor plants, simple relay and water-wheel controls, and fully automatic features has reduced materially plant investment, operating, and maintenance costs and has made use of small hydroelectric sites more desirable. Diagrams, graphs, table. 9 ref.

1861 System Grounding in Industrial Plants. F. M. Dorey. *Electrical Engineering*, v. 72, Dec. 1953, p. 1098-1103.
Condensed from a paper presented before the AIEE General Meeting, Phoenix, Ariz., Aug. 1952. Discusses importance of grounding and various satisfactory methods for 3-phase a.c. systems. Diagrams.

1862 Differential Reactive Current Protection Relay. R. W. Stineman. *Electrical Engineering*, v. 72, Dec. 1953, p. 1104.
Digest of paper 53-373, "Differential Reactive Current Protection Relay" presented before an AIEE Conference in Seattle, Wash., Sept.-Oct., 1953. Describes protective device developed for use in an aircraft a.c. electric system, as a solution to problems associated with reactive load division. Diagrams.

1863 Impedance Transformations in Band-Pass Filters. T. J. O'Donnell and E. M. Williams. *Electrical Engineering*, v. 72, Dec. 1953, p. 1105.
Digest of paper 53-143 "Maximum Impedance Transformations in Band-Pass Filters" for presentation at the AIEE Winter General Meeting, New York, N. Y., Jan. 1953. Design of band-pass impedance transforming filters is derived from Norton's equivalence between a dissymmetrical band-pass filter and a symmetrical section plus an ideal transformer. Diagrams, graph.

1864* Silicone Helps Solve Insulation Problems. John G Noest. *Electrical World*, v. 140, Nov. 16, 1953, p. 112-115.
Describes applications of silicone-glass isulations in power plants. Photographs, diagrams.

1865 Perspicacity and Serendipity Make Economical Distribution. T. A. Phillips. *Electric Light and Power*, v. 31, Nov. 1953, p. 110-112.
Outlines procedures for obtaining increased transmission efficiency. Photographs.

1866* Rotating Regulators Improve Light-Load Stability. II. Regulator Design, Tests, and Performance. L. F. Lischer and R. B. Gear. *Electric Light and Power*, v. 31, Nov. 1953, p. 133-137.
Includes graphs, photographs.

1867 The Design of High Q Iron Cored Inductors. N. H. Crowhurst. *Electronic Engineering*, v. 25, Nov. 1953, p. 478-482.

Includes diagrams, graphs.

1868* Current-Reversing Key for High Barrier Voltages. (German.) R. Brüderlink and H. G. Sauer. *Elektrotechnische Zeitschrift*, v. 5, Ausgabe B, no. 10, Oct. 1953, p. 327-330.

Discusses the difficulties encountered in the operation when constructed in the usual manner. Proposes new construction. Experiences with this construction are discussed. Diagrams. 12 ref.

1869* Double-Track "Thomalite" Brake Magnets for Electric Meters. H. Edler. *Elektrotechnische Zeitschrift*, v. 5, Ausgabe B, no. 10, Oct. 21, 1953, p. 330-333.

Describes material and construction of magnets with special regard to properties necessary for meters. Tables, graphs, diagrams.

1870* Maximum Arc Energy During Interruption of Alternating Current. H. Goldenberg. *Engineer*, v. 196, Nov. 6, 1953, p. 597-598.

Arc energy liberated during the first current loop is derived for a circuit consisting of an arc (of constant voltage characteristics), an inductance, and a resistance connected in series across a sinusoidal voltage source of negligible impedance and of any given frequency.

1871* Relay for Automatic Power Factor Correction. *Engineer*, v. 196, Nov. 13, 1953, p. 625-626.

Relay provides up to ten steps of condenser switching. Its sensitivity is adjustable, so that good use can be made of the various advantages accruing from power factor improvement. Photographs, diagrams.

1872* Paper-Making Machine With Electronic Control. *Engineering*, v. 176, Nov. 6, 1953, p. 595-597.

Describes machine constructed for Guard Bridge Paper Co., Ltd. Photographs, diagrams, tables.

1873* Standard Curves for Calculation of Forces Between Parallel and Perpendicular Conductor. Andrew S. Timascheff. *Engineering oJurnal*, v. 36, Oct. 1953, p. 1304-1310.

Presents a standard set of curves generally applicable for forces between characteristic circuit elements. Graphs, diagrams. 12 ref.

1874* The Effect of Electrical Fields on the Heat Transfer in Liquid Electrical Nonconductors. (German.) Ernst Schmidt and W. Leidenfrost. *Forschung auf dem Gebiet des Ingenieurwesens*, v. 19, Ausgabe B, no. 3, 1953, p. 65-80.

Increased heat conductivity of a dielectric liquid was shown to be due to convection currents caused by the electrical field. Diagrams, graphs, photographs. 17 ref.

1875* Impulse Permeability and Losses of Magnetic Materials During Square-Wave Impulses of Direct-Current Voltage Potential. (German.) Th. Einsele. *Frequenz*, v. 7, no. 10, Oct. 1953, p. 281-289.

Reports on calculations of distortions caused by impulse transmitters. Presents measurements of maximum impulse permeability and specific yield. Diagrams, graphs. 8 ref.

1876 The Why of White Fluorescent Lamps. C. N. Clark. *General Electric Review*, v. 56, Nov. 1953, p. 15-18.

Describes reasons for the several "whites" and their applications. Photographs, graphs, table.

1877* Causes and Measurement of Residual Potentiometer Noise. J. R. Altieri. *Instruments*, v. 26, Nov. 1953, p. 1712-1713, 1734-1735.

Noise in the output of actuated wire-wound potentiometers is particularly prevalent in precision potentiometers because of the low brush tensions required to achieve long life and critical accuracy under conditions of continuous actuation. Diagrams. 4 ref.

1878 The Hyperbolic Transmission Line as a Matching Section. Herbert J. Scott. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1654-1657.

Performance of the line is described in terms of its reflection coefficient. Diagram, graphs. 5 ref.

1879 Conformal Mappings for Filter Transfer Function Synthesis. George L. Matthaei. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1658-1664.

Reports that techniques utilizing conformal mappings provide practical ways for solving electrostatic problems. Diagrams. 11 ref.

1880* Testing Methods for High Voltage Current. (Swedish.) Marius Böckman. *IVA Tidskrift for Teknisk-Vetenskaplig Forskning*, v. 24, no. 6, 1953, p. 236-248.

Discusses various tests to determine the stresses in service that electrical equipment can withstand. Tables, graphs, oscillograms, photographs.

1881* Field Tests of High Voltage Systems. (Swedish.) Uno Sandström. *IVA Tidskrift for Teknisk-Ventenskaplig Forskning*, v. 24, no. 6, 1953, p. 249-256.

Field tests and measurements were made to provide information not obtainable from laboratory tests on stresses of electrical equipment. Photographs.

1882 High Capacity Magnesium Dry Cells. R. C. Kirk, P. F. George, and A. B. Fry. *Magnesium*, 1953, Nov., p. 10-13.

Describes composition, characteristics, and capacity.

1883* Electrical Papers. Philip L. Staats. *Paper Trade Journal*, v. 137, Nov. 13, 1953, p. 280-288.

Considers individually the specific characteristics of several of the more common types of electrical papers. Tables, photographs, graphs.

1884 Pipe Line Applications of Electric Motors. E. F. Greiwe. *Petroleum Engineer*, v. 25, Nov. 1953, p. D8, D10, D12-D14, D16-D17.

Discusses choice of enclosure, effects of heat, insulation, auxiliary equipment, and shaft alignment. Photographs.

1885 Electric Motor Controls. How to Pick One for Your Plant. L. T. Ellis and A. L. R. Maynard. *Petroleum Processing*, v. 8, Nov. 1953, p. 1692-1696.

Discusses problems to be considered in selecting proper controls. Photographs, diagram, table. 6 ref.

1886 Dielectric Polarization of a Dipolar Lattice. J. A. Pople. *Philosophical Magazine*, v. 44, 7th ser., no. 358, Nov. 1953, p. 1276-1280.

Mathematically analyzes the dielectric polarization of a model consisting of unpolarizable point dipoles fixed on the sites of a lattice but free to rotate. 7 ref.

1887* Tests of Fittings on Insulated Aluminum Cable. Joel Tompkins and E. K. Lanctot. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 865-873; disc., p. 873-874.

Aluminum fittings and cables were found to be satisfactory if properly designed. Test procedures are described. Photographs, graphs, diagrams.

1888* Lightning Protection in Extra-High-Voltage Stations—Influence of Multiple Circuits. I. W. Gross, L. B. LeVesconte, and J. K. Dillard. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 882-888., disc 888-890.

Discusses factors to consider in designing lightning protection. A typical installation is described. Diagram, tables, graphs. 10 ref.

1889* Reclosing Fuses, Automatic Oil Circuit Reclosers, and Automatic Reclosing Circuit Breakers in the Distribuiton Substation. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 901-908; disc., p. 908-911.

Presents results of a survey questionnaire on the above. Tables, graphs. 11 ref.

1890* A Pilot-Wire Relaying Scheme Utilizing the Product Differential Relay. R. I. Ward and D. W. Gilman. *Power*

Electrical Engineering

Apparatus and Systems, 1953, no. 8, Oct., p. 911-916, disc., p. 916-917.

System operates on either light or heavy fault currents and protects the station from high induced pilot-wire-to-ground voltages. Diagrams, graphs. 3 ref.

1891* Field Theory of Wave Propagation Along Coils. H. Poritsky, P. A. Abetti, and R. P. Jerrard. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 930-938; disc., p. 938-939.

Field solutions for surges were developed. Calculations agree with experimental values. Photographs, graphs, diagrams, tables. 12 ref.

1892* Special 3-Phase Core Arrangements. F. C. Roeding. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 939-942; disc., 942-944.

Analysis of several 3-phase systems show large eddy current losses and harmonics in the exciting current. Photographs, diagrams, graphs.

1893* Ground-Fault Neutralizer Grounding of Unit-Connected Generators. H. R. Tomlinson. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 953-960; disc., p. 960-961.

Above method is compared with 2 other general methods and is shown to be better. Photographs, diagrams, graphs. 13 ref.

1894* Calculation of No-Load Wave Shape of Salient-Pole A-C Generators. David Ginsberg, Alois L. Jokl, and Lester M. Blum. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 974-980; disc., p. 980.

Presents equations for evaluation of harmonics in curve from including the 11th harmonic. Graphs, tables. 4 ref.

1895* D-C Dynamic Braking of Squirrel-Cage Induction Motors. W. LaPierre and N. Metaxas. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 981-984; disc., p. 984-986.

Gives a rational method for estimating torque speed curves. Expressions for average torque and peak torque were derived. Tables, graphs, diagrams. 5 ref.

1896* Characteristics of Split-Phase Currents as a Source of Generator Protection. H. R. Sills and J. L. McKeever. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 1005-1013; disc., p. 1013-1016.

Shows how unbalance of split-phase currents can be used as warning of internal and external faults. Tables, graphs.

1897 Electrostatic Neutralizers. Robin Beach. *Product Engineering*, v. 24, Nov. 1953, p. 167-171.

Discusses method of locating neutralizers, their discharge characteristics, and safety considerations. Photographs, diagrams.

1898* Simple Tubeless Photo Timer. Kai M. Klemm. *Radio-Electronics*, v. 24, Dec. 1953, p. 74.

With no critical parts involved, timer is both accurate and durable. Diagram.

1899* Magnetostrictive and Electrostrictive Industrial Ultrasonic Apparatus. Neil Clark, Jr., Robert Quint, and Robert Roske. *Radio-Electronics*, v. 24, Dec. 1953, p. 82, 84, 88, 91, 92, 94.

Describes three ultrasonic devices of known commercial utility. Photographs, diagrams.

1900* The Dependence of Potential Difference on Limiting Current in Mixed Electrolytes. (English.) D. Macgillavry. *Recueil des travaux chimiques des Pays-Bas*, v. 72, nos. 9-19, Sept.-Oct. 1953, p. 859-866.

Steady states of ionic motions and steady distributions of concentrations are developed for mixed electrolytes when only one kind of ion is reducible at the cathode. 17 ref.

1901* A Valve Magohmmeter. M. G. Scroggie. *Wireless World*, v. 59, Nov. 1953, p. 516-521.

Includes diagrams.

1902 Rubber and Plastic Insulation in Cable. R. A. Schatzel. *Wire and Wire Products*, v. 28, Nov. 1953, p. 1196-1198, 1236-1239.

Reviews types, applications, and properties.

1903* Dynamic Phenomena in Selenium Rectifiers. (German.) Hans Lauckner. *Zeitschrift für angewandte Physik*, v. 5, no. 9, Sept. 1953, p. 341-349.

Describes preparation of rectifiers and measuring devices used to determine various factors responsible for the slow response of rectifiers to sudden voltage changes. Diagrams, graphs. 14 ref.

1904* Measuring Temperatures and Radiation on Water-Stabilized High-Pressure Electric Arc. (German.) Th. Peters. *Zeitschrift für Physik*, v. 135, no. 5, 1953, 573-592.

Describes arrangement and experimental procedure. Temperatures reached 12,000 K and pressures reached 1000 atmospheres. Tables, graphs, diagrams. 19 ref.

See also:
1540 (ceramic heating elements)
1572 (dielectric properties of glasses)
1581 (generation of ultrasonics)
1735 (dielectric breakdown of SF_6)
1751 (electromigration in "Nepton CR-51")
2216 (automatic controls)
2482 (sintered electric contact materials)
2687 (electric space heating)

ELECTROCHEMISTRY AND ELECTROPROCESSES

1905 Some Properties of Tin-II Sulfate Solutions and Their Role in Electrodeposition of Tin. II. Solutions with Tin-II Sulfate and Sulfuric Acid Present. Clarence A. Discher. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 480-484.

Reports measurement of density, refractive index, surface tension, viscosity, freezing point depression, conductivity, transference number, and electrode potential to pure tin and hydrogen. Discusses relationships between concentration and the magnitude of these properties. Tables, graphs. 4 ref.

1906 Electroplating on Titanium. William H. Colner, Morris Feinleib, and John N. Reding. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 485-489.

A method for obtaining adherent electrodeposits is described which includes subjecting the Ti to anodic etch prior to plating. Graph, photographs.

1907 An X-Ray Study of the Effect of Organic Compounds on the Crystal Growth of Nickel During Electrodeposition. Francis Denise and Henry Leidheiser, Jr. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 490-495.

Discusses effect on grain size and orientation. Reports orientation other than (100) produced brittle deposits. Photographs, tables, graph. 7 ref.

1908 Correlation of Limiting Currents Under Free Convection Conditions. C. R. Wilke, M. Eisenberg, and C. W. Tobias. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 513-523.

Discusses experimental studies of limiting rates of deposition of Cu ions at a vertical cathode in an unstirred solution. Diagram, photographs, tables, graphs. 23 ref.

1909 Some Observations on the Electrodeposition of Tin-Zinc Alloys. Bernard C. Lewsey. *Electroplating and Metal Finishing*, v. 6, Nov. 1953, p. 411-413.

Discusses equipment and procedures. Tables.

1910 The B.N.F. Jet Test on Organic Bright Nickel Deposits. *Electroplating and Metal Finishing*, v. 6, Nov. 1953, p. 417-418.

Discusses variations in the rate of penetration of coatings during thickness measurement. Graph. 3 ref.

1911 On the Electrochemistry of Ion-Exchange Resins a Review of Recent Work. K. S. Spiegler. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 303c-316c.

Reviews measurement of some electrochemical properties of

ion-exchange resins, such as specific conductances, ionic mobilities in the resins, and potentials across resinous membranes. Measurements are correlated to the general thermodynamic treatment of ion-exchange resins. Tables, photographs, graphs, diagrams. 78 ref.

1912* Studies on the Anodic Behavior of Nickel. II. (German.) G. Trümpler and W. Saxer. *Helvetica Chimica Acta*, v. 36, no. 6, 1953, p. 1630-1639.

Reports on comparative experiments on 2 electrodes of high and highest purity Ni with special consideration of the course of passivation in dependence upon the "critical" potential. Tables, graphs. 14 ref.

1913* Studies on the Electrodeposition of Brass from Non-Cyanide Bath. I. S. K. Ray and T. Banerjee. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Sept. 1953, p. 438-443.

Electrodeposition of brass from a bath containing cupric tartrate and sodium zincate is described. Graphs, tables. 18 ref.

1914 Properties of HAE Finish for Magnesium. R. G. Gillespie. *Materials & Methods*, v. 38, Nov. 1953, p. 104-105.

Describes electrolytically applied ceramic coating which has excellent corrosion, abrasion, and heat resistance. Photographs.

1915* Chromium Plating Die-Cast Aluminum Engine Cylinders. Fred M. Burt. *Metal Finishing*, v. 51, Nov. 1953, p. 65-69.

Describes equipment, plant layout, and operating procedures. Photographs, diagram.

1916* Growth of Prallel Grooves on Soluble Anodes by Electrolysis. Toshio B. Horiuchi. *Metal Finishing*, v. 51, Nov. 1953, p. 70-74.

Concludes that grooves are formed by bubbles which form at the lower part of the anode and ascend along the anode surface. Photographs, diagrams.

1917* Problems of Excessive Voltage in Electrolytic Hydrogen Liberation. (German.) Ludwig Kandler. *Metalloberfläche*, Ausgabe A, v. 7, no. 11, Nov. 1953, p. 167-168.

Presents a theoretical discussion. Practical implications for the technique of electrolysis are indicated.

1918* The Application of Polarographic Adsorption Analysis to the Investigation of Electrolytic Bright Baths. (German.) J. Smelik. *Metalloberfläche*, Ausgabe B, v. 5, no. 11, Nov. 1953, p. 165-169.

Discusses quantitative control of organic additions to bright baths. Theoretical basis and practical process are indicated. Tables, graphs. 8 ref.

1919 Electroplating Prior to Hot Galvanizing for Improved Results. Allen T. Baldwin. *Metal Progress*, v. 64, Dec. 1953, p. 76-81.

Specimens of A.I.S.I. 1010 steel with thin precoats of Zn, Sn, Ni, and Fe were compared with specimens galvanized with no precoat. Early indications show the process may be economical if more efficient heating methods are adopted. Microphotographs.

1920* Thickness of Electrodeposited Coatings by the Anodic Solution Method. C. F. Waite. *Plating*, v. 40, Nov. 1953, p. 1245-1248; disc., p. 1253-1254.

Describes technique and applications. Discusses advantages in certain instances over drop test or magnetic methods. Diagrams, table.

1921* Electrolytic Polishing of Steel at Elevated Temperatures. (Polish.) Z. Wojcik. *Prace Instytutow Ministerstwa Hutnictwa*, v. 5, no. 3, 1953, p. 123-128.

Presents principles for the preparation of suitable electrolytes and describes the technique. Graph, diagram, micrographs. 12 ref.

1922* Finishes for Soft Soldering. Clean Finishes. E. E. Halls. *Product Finishing*, v. 6, Oct. 1953, p. 66-76, 120.

Discusses requirements and production methods. Tables.

1923* Separation of Tantalum, Titanium and Sodium From Molten Salt Mixtures to Form Sodium-Lead Alloys. (German.) Paul Drossbach. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, p. 548-558.

Describes thyratron device used to measure polarization and individual properties after the current is switched off. Describes separation of Na from molten salt mixtures, Ta from molten potassium tantalum fluoride, and Ti from molten potassium titanium fluoride. Diagrams, graphs, tables. 3 ref.

1924* New Methods of Applying Electrical Energy to Chemical Processes. Glow-Light Electrolysis. (German.) A. Klemenc and G. Ofner. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, p. 615-617.

Solutions which contain organic substances were shown to yield gases with high H_2 and CO content suitable for the synthesis of hydrocarbons. Diagrams, tables.

1925* Distribution of the Direct-Current Electric Field in Electrolyzers. Graphic Method of Constructing the Field. (Russian.) G. V. Forsblom. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 3, Mar. 1953, p. 321-329.

Includes graphs. 3 ref.

1926 Study of Electrocrystallization of Metals in an Ultrasonic Field. (Russian.) S. M. Kochergin and N. N. Terpilovskii. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 3, Mar. 1953, p. 394-398.

Mechanism of the effect of ultrasonic vibrations on electrodeposition was studied. Diagrams, graphs. 4 ref.

See also:

1753 (electrolyte solutions in Bromine)
1823 (electrochemical corrosion of metals)
2479 (electrodeposition of Cu powder)
2662 (treatment of plating wastes)

ELECTRONICS

1927* The Effect of the Oceanic Duct on Microwave Propagation. L. J. Anderson and E. E. Gossard. *American Geophysical Union, Transaction*, v. 34, Oct. 1953, p. 695-700.

Experimental radio and meteorological data was examined to ascertain how radar propagation is effected by the microwave duct lying next to sea surface. Graphs. 9 ref.

1928 Handbook of Sound Reproduciton. XIV. Tone Control and Equalization. Edgar M. Villchur. *Audio Engineering*, v. 37, Nov. 1953, p. 25-28, 61-63.

Describes simpler methods of obtaining frequency response equalization by use of resistors and capacitors. Discusses expander circuits. Graphs, diagram. 16 ref.

1929* Programme Design for the C.S.I.R.O. Mark I Computer. I. Computer Conventions. II. Programme Techniques. T. Pearcey and C. W. Hill. *Australian Journal of Physics*, v. 6, Sept. 1953, p. 316-356.

The code system is of a two-address type in which each operation called by an "order" or "command" is thought of as a quality of a transfer of the content of one "register" to another. Diagram, tables. 6 ref.

1930* L3 Coaxial System—Amplifiers. L. H. Morris, G. H. Lovell, and F. R. Dickinson. *Communication and Electronics*, 1953, Nov., p. 505-517.

Discusses design and operating characteristics of both line and flat amplifiers. Photographs, tables, diagrams, graphs. 8 ref.

1931* A Level Compensator for Telephotograph Systems. T. A. Jones and W. A. Phelps. *Communication and Electronics*, 1953, Nov., p. 537-541.

Presents description and discusses performance characteristics. Graphs, photographs, diagram. 4 ref.

1932* L3 Coaxial System—Television Terminals. John W. Rieke and R. S. Graham. *Communication and Electronics*, 1953, Nov., p. 541-551.

Transmitting and receiving terminals are described illustrating functional operation and mechanical and electrical arrangements of the equipment. Diagrams, photographs, graphs. 10 ref.

Electronics

1933* Block-Diagram Solutions for Vacuum-Tube Circuits. T. M. Stout. *Communication and Electronics*, 1953, Nov., p. 561-567.

Reports that analysis of feedback amplifiers using block-diagram methods from start to finish offers a number of possible advantages over more conventional methods. Diagrams. 14 ref.

1934* A Progressive Code Digital Quantizer. Floyd Raasch. *Communication and Electronics*, 1953, Nov., p. 567-571.

Describes an analog-to-digital converter which uses a progressive coding scheme to lessen chances of incorrect readings. Tables, diagrams, photographs. 7 ref.

1935* A Permeability Analyzer for Magnetic Amplifier Cores. Philip Siskind. *Communication and Electronics*, 1953, p. 572-576.

Discusses theory and design of instrument which measures, with the aid of an oscilloscope, differential permeability of toroidal cores used in magnetic amplifiers. Diagrams, graphs, photograph.

1936* The Map Method for Synthesis of Combinational Logic Circuits. M. Karnaugh. *Communication and Electronics*, 1953, Nov., p. 593-598; disc., p. 598-599.

A method is presented with the advantage of flexibility and speed. Diagrams, tables. 5 ref.

1937* The Control of Noise and Crosstalk on N1 Carrier Systems. A. J. Aikens and C. S. Thaeler. *Communication and Electronics*, 1953, Nov., p. 605-610; disc., p. 610-611.

Presents a discussion of noise sources including system noise, secondary induction from telephone plant, secondary induction from external sources, and non-soldered cable pair joints. Suggests methods of control. Diagrams, table.

1938* Transmission Design of Intertoll Telephone Trunks. H. R. Huntley. *Communication and Electronics*, 1953, Nov., p. 670-676; disc., p. 676.

Includes diagrams, tables, graph. 4 ref.

1939* Heat Transfer From Electron Tubes at High Altitudes and High Ambient Temperatures. B. O. Buckland. *Communication and Electronics*, 1953, Nov., p. 698-703; disc., p. 703.

Includes graphs, diagram, photograph.

1940* Interpretation of Observations on Photoconductivity in Strong Fields. (French.) Daniel Curie. *Comptes rendus*, v. 237, no. 15, Oct. 12, 1953, p. 791-794.

Presents interpretation of recent observations on ZnS based on the ionization of donor levels. 5 ref.

1941* Simplified Pi-Network Solutions. J. J. Hoefer. *CQ Radio Amateurs' Journal*, v. 9, Nov. 1953, p. 24-25, 66.

Discusses elementary theory and describes working example. Diagrams, graph.

1942 Fast-Acting Digital Memory Systems. II. Isaac L. Auerbach. *Electrical Manufacturing*, v. 52, Nov. 1953, p. 136-143.

Discusses delay lines, electrostatic storage, ferro-electric storage, electronic bistable circuits, and the diode-capacitor circuit. Tables, graphs, diagrams.

1943 A Remote Control and Telemetering for a Van De Graff Generator. I. B. Miller. *Electronic Engineering*, v. 25, Nov. 1953, p. 446-450.

Includes photographs, diagrams. 4 ref. (To be continued.)

1944 Audar. R. H. James. *Electronic Engineering*, v. 25, Nov. 1953, p. 451-455.

Describes equipment which has been constructed to provide audio detection and ranging for purpose of demonstrating radar principles. Diagrams, photographs.

1945 Characteristics of the Temperature-Limited Diode Type 29Cl. F. A. Benson and M. S. Seaman. *Electronic Engineering*, v. 25, Nov. 1953, p. 462-464.

Details are given of static characteristics of the tubes together with some information obtained from long-term tests. Diagram, graphs, tables.

1946 Electronic Analogue Integration and Differentiation. P. S. Brandon. *Electronic Engineering*, v. 25, Nov. 1953, p. 476-477.

Includes diagrams.

1947* The Wave-Forms of Atmospherics. M. W. Chiplonkar. *Endeavour*, v. 12, Oct. 1953, p. 190-196.

Presents a review of experimental work and shows relationship with radio communication. Figures, graphs. 28 ref.

1948 Analog Computers—Successor to Cut and Try. C. E. Bradford and W. M. Gaines. *General Electric Review*, v. 56, Nov. 1953, p. 24-27, 61.

Discusses applications to operation of turbojet aircraft. Photographs, diagrams.

1949 Microwave Radio's Longest Private System. C. M. Heiden. *General Electric Review*, v. 56, Nov. 1953, p. 52-55, 61.

Describes control system of a 30 inch gas line running 1840 miles from Galveston, Texas, area to New York. Relay stations are about 30 miles apart. Photographs, diagrams.

1950 New Tricks for an Old Calculating Board. J. F. Fuller. *General Electrical Review*, v. 56, Nov. 1953, p. 60.

Describes use of a d.c. network analyzer or a per-unit analyzer as a limited analog computer. Photographs.

1951 Geologic Aspects of Radio Wave Transmission. M. William Pullen. *Illinois State Geological Survey Report of Investigations* no. 162, 1953, 73 p. (TN21 IL6.7r)

Illustrates many of the factors and features affecting radio field intensity at broadcast frequencies. Evaluates use of field intensity measurements and offers a new concept of methods of transmission of radio waves through earth materials. Graphs, photographs, maps. 42 ref.

1952* Experimental Investigation of Noise Associated With Modulated Pulses. V. Narayana Rao. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Aug. 1953, p. 184-193.

Theory of noise associated with pulses is considered from the point of view of application to the study of noise in pulse communication. Process of slicing and its effect on the signal to noise ratio are also considered. Diagrams, graphs. 6 ref.

1953* Time Is of the Essence. Milton W. Blatner. *Industrial Photography*, v. 2, Oct. 1953, p. 32, 36.

Presents general information on the subject of timers and time control. Photographs.

1954* Electrometer Tubes. D. L. Collins. *Instruments*, v. 26, Nov. 1953, p. 1708-1709, 1740-1744.

Electrometer tubes are necessary for high-impedance pickups such as ion chambers. Characteristics, limitations, types, and basic circuits are presented. Diagrams.

1955 Aviation Electronics. Arthur Van Dyck. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1572-1578.

Presents problems of complexity and unreliability in aviation electronics. Suggestions are given for improvement. Particular emphasis is placed on need for more realistic requirement specifications by planning agencies and for more intimate relations among electronic engineers, aircraft engineers, and field operations.

1956 The Development of a Variable Time Delay. Kenneth W. Goff. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1578-1584.

Describes design, construction, and performance of a magnetic-recording drum time-delay system. Diagrams, photographs, graphs. 14 ref.

1957 Design and Performance of High-Power Pulsed Klystron. M. Chodorow, E. L. Ginzton, I. R. Neilson, and S. Sonkin. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1584-1602.

Describes design, theory, construction, and operation of multi-megawatt pulsed klystrons. Diagrams, photographs, graphs. 24 ref.

1958 Backward-Wave Tubes. R. Kompfner and N. T. Williams. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1602-1611.

Experiments with the Millman tube, a spatial harmonic type of traveling-wave amplifier, have shown that amplification and oscillations utilizing backward traveling spatial harmonic components of an electro-magnetic wave can be obtained. A simple theory of backward gain is presented. Diagrams, graphs, oscillograms. 5 ref.

1959 Underearth Quartz Crystal Resonators. Thomas A. Pendleton. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1612-1614.

Advantages of using precision quartz resonators in conjunction with frequency standard oscillators are explained. Diagram, graph.

1960 The Optimum DC Design of Flip-Flops. D. K. Ritchie. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1614-1617.

A method for the design of flip-flops is described which includes component and voltage tolerances. Method may also be applied to design of other similar switching circuits. Diagrams. 8 ref.

1961 Traveling-Wave Tube Helix Impedance. Ping King Tien. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1617-1623.

Develops theory for computing impedance. Shows that results obtained from the theory can be used to evaluate the helix impedance for usual types of traveling wave tubes. Diagrams, graphs, table. 8 ref.

1962 Traveling-Wave Slot Antennas. J. N. Hines, V. H. Rumsey, and C. H. Walter. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1624-1631.

Describes four types and presents a technique of array design which permits the array pattern to be predicted exactly from measurements made by exciting individual elements of the array. Diagrams, graphs. 19 ref.

1963 Prediction of Traveling Wave Magnetron Frequency Characteristics: Frequency Pushing and Voltages Tuning. H. W. Welch, Jr. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1631-1653.

Presents an analysis which explains frequency pushing and voltage tuning. Graphs, diagrams, oscillographs. 28 ref.

1964 A Method of Band-Pass Amplifier Alignment. J. J. Hupert and A. M. Reslock. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1668-1671.

Discusses method based on the oscilloscopic display of second order harmonic distortion as a function of the carrier frequency departure from the pass-band center. Diagrams, graphs, oscillograph.

1965 Excitation Coefficients and Beamwidths of Tschebyscheff Arrays. Robert J. Stegen. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1671-1674.

Presents method for obtaining expressions for the above. Graphs. 5 ref.

1966 On the Diffusion of Decaying Particles in a Radial Electric Field. Julian Keilson. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1397-1400.

Physical problem treated is of specific interest to transistor theory. Some techniques used in treating the problem are of more general interest. Diagrams, graphs.

1967 A Summary of Semiconductor and Transistor Theory. Robert A. Lefever. *Journal of Chemical Education*, v. 30, Nov. 1953, p. 554-556.

Includes diagrams.

1968 Stabilised Power Supply. *Machinery Lloyd (Overseas Ed.)*, v. 25, Nov. 1953, p. 100-101.

Describes specifications and operation. Includes diagram, photograph.

1969 Extending Engineering Skills With Large-Scale Digital Computers. Allen Keller. *Mechanical Engineering*, v. 75, Nov. 1953, p. 891-895.

Presents proposed design and applications of model computers in the future. Suggests study to determine economic feasibility for any specific organization. Diagrams.

1970* Studies of Magnetic Recording. V. Comparison With Experiments. W. K. Westmijze. *Philips Research Reports*, v. 8, Oct. 1953, p. 343-366.

Results of some theoretical calculations are compared with experimentally observed relation between input and output voltages. Diagrams, graphs. 45 ref.

1971* Quantizing Noise of a Single Integration Delta Modulation System With an *N*-Digit Code. H. Van de Weg. *Philips Research Reports*, v. 8, Oct. 1953, p. 367-385.

In order to compare the ΔM system with the PCM system as regards bandwidth required to obtain a certain signal-to-quantizing-noise ratio, the quantizing noise is calculated for a single-integration ΔM system. Graphs. 9 ref.

1972* An Electronic Hearing Aid. P. Blom. *Philips Technical Review*, v. 15, Aug. 1953, p. 37-48.

Reports that for an electronic hearing aid to have the widest possible field of application it should be easily adaptable to suit the many different forms of deafness that exist. Photographs, diagrams, graphs. 5 ref.

1973* The Efficiency of Fluorescence in Cathode-Ray Tubes. A. Bril and H. A. Klasens. *Philips Technical Review*, v. 15, Aug. 1953, p. 63-72.

Special measurements and theoretical considerations made it possible to determine conditions for optimum screen brightness with given electron energy. Photograph, diagrams, tables, graphs. 6 ref.

1974 Theory of A.C. Space-Charge Polarization Effects in Photoconductors, Semiconductors, and Electrolytes. J. Ross MacDonald. *Physical Review*, v. 92, ser. 2, Oct. 1953, p. 4-17.

Develops a linear theory which is compared with earlier work. Tables, graphs.

1975 Thermal Effects at Point Contact Diodes. P. M. Tipple and H. K. Henisch. *Physical Society, Proceedings*, v. 66, no. 406B, Oct. 1953, p. 826-832.

Describes a thermoelectric method of measuring the temperature at point contact. A Ge diodie shows a critical contact temperature for voltage turnover on its voltage-current characteristic. Diagram, graphs. 6 ref.

1976 Theory of the Forward Characteristics of Injecting Point Contacts. P. C. Banbury. *Physical Society, Proceedings*, v. 66, no. 406B, Oct. 1953, p. 833-840.

Derives voltage-current relationship across a metal-semiconductor point contact. Diagrams, graphs. 3 ref.

1977 Forward Characteristic of Injecting Area Contacts on Germanium. H. K. Henisch and F. D. Morten. *Physical Society, Proceedings*, v. 66, no. 406B, Oct. 1953, p. 841-844.

Describes investigation of voltage-current relation of the barrier associated with an injecting area Ge contact. Method is based on capacitance. Diagram, graphs.

1978* Field Experience—Electronic Mho Distance Relay. H. C. Barnes and R. H. Macpherson. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 857-864; disc., p. 865.

Advantages of very high speed and reduced burden are at present overshadowed by tube limitations. Photographs, diagrams, tables, graphs.

1979* Hydraulic Operating Mechanisms for High-Capacity Circuit Breakers. E. E. Briggs, R. D. Hambrick, and D. M. Umphrey. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 874-879; disc., p. 879-881.

Describes an improved, more reliable unit that does not depend on compressed air or spring tension. Photograph, diagrams.

1980* Automatic Control of Hydroelectric Induction Generators. J. G. Kirwin and W. D. Smith. *Power Apparatus and Systems*, 1953, no. 8, Oct., p. 1000-1004.

Describes the comparative simplicity of induction generators and apparatus for automatic control. Diagrams. 3 ref.

Electronics

1981* The Ionic Oscillator. Thomas E. Fairbairn. *Radio-Electronics*, v. 24, Dec. 1953, p. 76, 78, 80.

New ionic oscillator can deliver high output at audio or radio frequencies and has good stability over long periods of time. Diagrams, photographs.

1982* A 220 Mc. R.F. Amplifier. Leroy W. May. *Radio & Television News*, v. 50, Dec. 7953, p. 68-69, 118.

Details of construction are given for a half-wave line amplifier which makes adequate power practical on the 220 mc. band. Photographs, diagram.

1983* The Transistor D.C. Amplifier. Herbert F. Starke. *Radio & Television News*, v. 50, Dec. 1953, p. 82-83, 148-151.

A new and interesting application of transistors in the instrumentation field. Increased sensitivity is obtained. Photographs, diagrams.

1984* The Story of Radar. A. F. Wilkins. *Research*, v. 6, Nov. 1953, p. 434-440.

Discusses development of radar as a navigational technique and as a stimulus to electronics and physical science. Diagrams, photographs.

1985 A Low-Frequency Oscillator. R. M. Howe and R. J. Leite. *Review of Scientific Instruments*, v. 24, Oct. 1953, p. 901-903.

Discusses design, theory of operation, and applications of new instrument particularly useful in design and testing of servomechanisms and electronic simulators. Diagrams. 6 ref.

1986 A Disc-Seal Triode as a UHF Amplifier. S. Christopher Peek. *Sylvania Technologist*, v. 6, Oct. 1953, p. 81-85.

Discusses construction and performance. Diagrams.

1987* Activated Adsorption in Semiconductors. (Russian.) F. F. Vol'kenshtein. *Uspekhi Fizicheskikh Nauk*, v. 50, no. 2, June 1953, p. 253-270.

Presents a qualitative examination of the problem. Activated adsorption is not always explained by a universal mechanism. Diagrams, graphs. 10 ref.

1988* Application of Electronic Amplifiers for Computing Elementary Particles and Quanta. (Russian.) T. M. Lifshits. *Uspekhi Fizicheskikh*, v. 50, no. 3, July 1953, p. 365-429.

Describes characteristics of multipliers and methods of recording and reading various types of radiation. Photographs, diagrams, graphs. 149 ref.

1989* Noise Factor of Conventional VHF Amplifiers. N. Houlding. *Wireless Engineer*, v. 30, Nov. 1953, p. 281-290.

Discusses basic considerations and triode imput stages. Diagrams. (To be concluded.)

1990* Television Aerials of the Future. F. R. W. Strafford. *Wireless World*, v. 59, Nov. 1953, p. 506-510.

Includes diagrams, graph.

1991* Point Contact Germanium Rectifiers. R. T. Lovelock. *Wireless World*, v. 59, Nov. 1953, p. 511-514.

Discusses electrical conduction in solids and rectifier characteristics of Ge. Graphs, diagrams. (To be concluded.)

1992* Network Computations Solved 8 Times as Fast. Price D. Wickersham. *World Oil*, v. 137, Nov. 1953, p. 238, 241.

Electronic analyzer permits rapid and accurate studies of a wide range of pipe line fluid flow problems. Photographs.

1993* Picture Distortions From the Asymmetrics of Pole Shoes in Electronic Lenses. (German.) Walter Glaser and Peter Schiske. *Zeitschrift für angewandte Physik*, v. 5, no. 9, Sept. 1953, p. 329-339.

Presents a mathematical discussion. 16 ref.

1994* Secondary Electron Emission of Semiconductors. (German.) H. Gobrecht and F. Speer. *Zeitschrift für Physik*, v. 135, no. 5, 1953, p. 602-614.

Discusses influence of impurity content of Ge, Se, Ga, Sb, Tl, and Bi crystals on secondary electron emission. Diagrams, graphs, tables. 15 ref.

See also:
1593 (electronic controls)
2083 (electronics in gas industry)
2188 (new advances in electron-microscopy)
2230 (shielded rooms for electronic measurements)
2764 (electronic controls for paper mill drives)

ENGINEERING ECONOMICS

1995* The Interrelationships of Agronomy and Economics in Research and Recommendations to Farmers. Earl O. Heady and W. D. Shrader. *Agronomy Journal*, v. 45, Oct. 1953, p. 496-502.

Includes tables, graphs. 10 ref.

1996* New Capacity Credit Method Provides for Allocations of Costs in Gas Systems. Hans E. Nissel. *American Gas Journal*, v. 179, Oct. 15, 1953, p. 16-17, 37.

1997* Home Garden Market. *Agricultural Chemicals*, v. 8, Nov. 1953, p. 38-43, 133, 135, 137.

Discusses how the "home garden" market for agricultural chemicals has proven profitable to trade. Photographs.

1998* Water Rights and Administration with Respect to Soil and Water Conservation. C. E. Busby. *Agricultural Engineering*, v. 34, Nov. 1953, p. 769-770, 772, 774, 776, 778, 780.

Discusses briefly some of the factors which give rise to water problems having legal and administrative implications.

1999* A Method of Analysis for Double Classification. E. J. Williams. *Australian Journal of Applied Science*, v. 4, Sept. 1953, p. 357-370.

Describes a method satisfactory for data which do not depart greatly from orthomogonality. 9 ref.

2000* Western Electric's Part in Offsetting Rising Costs. Howard G. Anderson. *Bell Telephone Magazine*, v. 32, Autumn 1953, p. 170-183.

Describes technological advances which are helping to overcome effects of inflation on cost of providing telephone service. Photographs.

2001* Foresees New Use for Anthracite. *Black Diamond*, v. 131, Nov. 14, 1953, p. 35.

Discusses new uses in industrial heating, nodulizing iron ore, and gasification processes.

2002* What the C.C.C. Loan Plan Means to Banking. Ed. Tyng. *Burroughs Clearing House*, v. 38, Nov. 1953, p. 32-33, 88.

Discusses probable effects of the Commodity Credit Corporation's plan to extend to the banking system a portion of Government's crop support loans. Photograph.

2003 Ways and Means of Cutting Coal Handling Costs. Jack Bray. *Coal-Heat*, v. 65, Nov. 1953, p. 26-28.

This cost analysis primarily concerns unloading and reclaiming, or reloading phases, of coal yard operations. Photographs.

2004* Higher Analysis Fertilizers Help Cut Farm Costs. Firman E. Bear. *Crops & Soils*, v. 6, Nov. 1953, p. 6-7, 28.

Discusses economy of using high analysis fertilizers. Describes effects on soil acidity and presents formulas and costs for 5 grades of fertilizers. Tables, photographs, diagrams.

2005* Standard Costs for the Drilling Industry. E. H. Sloyer. *Drilling Contractor*, v. 9, Oct. 15, 1953, p. 68, 70, 72.

Presents a system of cost accounting.

2006* Competitive Industry and Government Regulation. Sinclair Weeks. *Edison Electric Institute Bulletin*, v. 21, Aug. 1953, p. 299-301, 323.

Address before the 61st General Meeting of AISI.

2007 Two Points of View on Tariffs. Our Protective Tariff Religion. Harrison Schmitt. **Free Trade—Theories**

and Realities. Otto Herres. *Engineering and Mining Journal*, v. 154, Nov. 1953, p. 78-83, 106.

2008* Improved Accounting for Profits. *Fueloil & Oil Heat*, v. 12, Nov. 1953, p. 78-79.

Reviews one company's purposes for setting-up new methods of handling figure work. Discusses results achieved with Burroughs Sensimatic accounting machines. Photographs.

2009* Industry-Wide Market Analysis and Trends of Developments. *Glass Digest*, v. 32, Oct. 1953, p. 18-19, 22.

Presents letter and 2 questionnaires sent to jobber and dealer firms handling various glass products. Survey includes products handled, used, or considered, and various methods of advertising. Shows partial returns from 200 jobber surveys compiled. Tables.

2010* Standards for Timing and Maintaining Automatic Machines. George M. Woodruff. *Glass Packer*, v. 32, Nov. 1953, p. 25-27, 58.

Manufacturer proves that standards and periodic audit of each machine's performance can raise efficiency to a level of 95-98%. Diagram, graph, tables.

2011 Resources for the Chemical Industry in the United States. I. Rocky Mountain States. Walter I. R. Murphy. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2423-2481.

Discusses 4 states with 15% of the land area but only 1.43% of the population of the U. S. The following 9 papers are presented: "Availability of Raw Materials". "Idaho", Junius Larsen and William C. Peters; "Montana", Forbes Robertson, Harry W. Camp, Jr., Leon H. Johnson, and Uuno M. Sahinen; "New Mexico", Morris F. Stubbs and Robert H. Weber; "Wyoming", Henry G. Fisk; "Educational and Research Facilities", Lloyd Berg; "Water Resources", W. W. Wheeler; "Electric Power Availability", A. B. Martin; "Plant Construction Factors", John F. O'Connell; and "Trends of Chemical Industry and Chemical Markets", M. J. Sinnott, Brymer Williams, and J. Louis York. Maps, tables, graphs. 316 ref.

2012* Our 29 Latin-American Markets 1937-1953. *International Markets*, v. 7, Oct. 1953, p. 8-11, 13-14.

Presents a re-appraisal of trade patterns and potentials. Photographs. 7 ref.

2013* Growth of Electric Power Industry in Latin America. Henry W. Balgooyen. *International Markets*, v. 7, Oct. 1953, p. 15-16, 18-19.

Reports that Latin America has surpassed the world in rate of growth of electric power production during past two decades. Photographs, tables, graph.

2014* Brazilian Foreign Trade. Oswaldo Benjamin de Azevedo. *International Markets*, v. 7, Oct. 1953, p. 20-23.

Presents general description of Brazil's expanded economy in foreign markets. Photographs, tables.

2015 Salute to the South. Your Industrial Market. *Iron Age*, v. 172, Nov. 12, 1953, p. 195-226.

Includes "How Deep Are the Roots of the Southern Boom?", Tom Campbell; "How Far Along is Industrial Development of the South?", Fred L. Allen; "Research is Surging in the South", Thomas Martin; "Spot Checking Metalworking in the South", Tom Campbell; "Sensitive Indicators of Growth in the South"; "South is Fast Growing Market for New Cars, Trucks", Walter G. Patton; "What About the South's Labor?", "Southern Newsfront"; "Why Are They, What Do They Make? Directory of Southern Metalworking Plants"; and "Ask Mr. South—If you Want More Details". Tables, graphs.

2016* Location and Development of Cotton Industry. R. Robson. *Journal of Industrial Economics*, v. 1, no. 2, Apr. 1953, p. 99-125.

Fundamental trends in development of the cotton industry and trade throughout the world are discussed. Tables.

2017* Note on the Establishment of Branch Factories. Glyn Picton. *Journal of Industrial Economics*, v. 1, no. 2, Apr. 1953, p. 126-131.

Studies were made of some Midland businesses which have established branch factories in South Wales. Operating costs were studied to determine their effect on location and establishment of branches.

2018* Some Critical Remarks on the Significance and Use of the Break-Even Point. J. L. Meij. *Journal of Industrial Economics*, v. 1, no. 2, Apr. 1953, p. 132-139.

Concludes that break-even point is not an important instrument in sales-policy. Graphs.

2019* The Influence of Economic Factors on the Location of Oil Refineries. J. D. Butler. *Journal of Industrial Economics*, v. 1, no. 3, July 1953, p. 187-201.

Outlines the historical development of economic influence. Explains circumstances in which departures from the principle of source refining have been made. Tables.

2020* Integration in the Oil Industry. P. H. Frankel. *Journal of Industrial Economics*, v. 1, no. 3, July 1953, p. 202-211.

Discusses economic motives affecting integration.

2021* Industrial Economic Problems in the Post-War Aluminum Market in the United States. Leonard A. Doyle. *Journal of Industrial Economics*, v. 1, no. 3, July 1953, p. 212-230.

Presents reasons for the behavior of Al prices in the period 1946-1951. Discusses implications of the market structure for the price-output decisions of integrated firms and producers of secondary Al.

2022* The Control and Oversight of Capital Expenditure Within Unilever. L. G. Norton and J. E. Wall. *Journal of Industrial Economics*, v. 1, no. 3, July 1953, p. 241-253.

Discusses general problems affecting the control of capital expenditure. Presents a brief outline of the organization and procedure followed at Unilever.

2023 Producing Automotive Accessories by Cost-Cutting Methods. Lloyd F. Christensen. *Machinery*, v. 60, Nov. 1953, p. 178-185.

Transfer presses, progressive dies, thread-rolling, and other interesting set-ups were used to increase the production and lower the cost of manufacturing improved quality automotive accessories, such as air cleaners, speedometers, fuel pumps, oil filters, and spark plugs. Photographs, diagrams.

2024 Costs Reduction Through Electronic Production Control. R. G. Canning. *Mechanical Engineering*, v. 75, Nov. 1953, p. 887-890.

Possibility of using an electronic system to take over many routine clerical operations and to assist in some non-routine operations is discussed. Diagrams. 3 ref.

2025* Larger Zinc Supply Predicted for Die Casters at Prices Tending to Fluctuate Less Violently. Simon D. Strauss. *Metals (Daily Metal Reporter Monthly Supplement)*, v. 24, Oct. 1953, p. 7, 19.

Reports industry's interest best served by profitable price for miners and smelters.

2026* Sliding Lead, Zinc Import Tax Would Encourage Price Instability and Not Benefit U. S. Mines. Jean Vuillequez. *Metal (Daily Metal Reporter Monthly Supplement)*, v. 24, Oct. 1953, p. 8, 19.

Reports that producers ultimately will gain more by striving to increase current consumption and discovering new uses for both metals.

2027 Latin-American Steel Present Position and Future Possibilities. *Metallurgia*, v. 48, no. 288, Oct. 1953, p. 159-164.

Reports that although iron ore, man-power, and wage positions are favorable to development of native iron and steel industries, lack of capital and scarcity of coking coal are serious drawbacks. Gives particulars of ore, coal, electricity, and steel positions in seven of these countries. Tables.

2028* The Preservation and Expansion of Pennsylvania's Mineral Industrial Economy. A. H. Letzler. *Mineral Industries*, v. 23, no. 2, Nov. 1953, 8 p.

Engineering Economics

2029* Conservation of Manganese. *Mining Journal*, v. 241, Oct. 16, 1953, p. 440-441.

Presents précis of various official reports on subject of Mn conservation. Discusses possible methods of economy in use of Mn resources.

2030 A New Concept of Conservation. Clyde Williams. *Monthly Business Review*, v. 35, Nov. 1953, p. 11.

Points out opportunities for conservation by improving the efficiency of utilization of fuel and production of commodities, and by discovery and development of energy and raw materials supplies that have previously been considered uneconomical to exploit.

2031 The Cost of Operating a Service Station. *National Petroleum News*, v. 45, Nov. 4, 1953, p. 38, 41.

Discusses sales volume, operating expenses, and net profits for average service station. Tables.

2032 What About Aromatics Demand? L. A. Schlueter. *Oil and Gas Journal*, v. 52, Nov. 23, 1953, p. 80, 83-84, 109.

Address presented at annual meeting of Amer. Coke & Chemical Inst., Oct. 13, 1953.

2033 40 Million Barrels of Additional Oil. William P. Sterne. *Oil and Gas Journal*, v. 52, Nov. 23, 1953, p. 101-102, 104-105, 107-109.

Through carefully planned pressure maintenance projects over 40 million barrels of oil will be saved in the Texas fields. Graphs.

2034* Prosperous Multiple Business Grows Out of Roncari Family's Venture. Walter E. Trauffer. *Pit and Quarry*, v. 46, Nov. 1953, p. 99-102.

Describes equipment, plant layout, and operating procedure. Photographs.

2035* The Industrial Importance of Water. Edward H. Clohessy. *Plant*, v. 8, Nov. 1953, p. 65.

Summarizes results of survey of industrial water users to determine just how important water is to industry, how it is used, and what is being done to conserve it. Table, photographs.

2036 Standardized Industrial Boilers Can Keep Your Steam Costs Down. Carl E. Miller. *Power Engineering*, v. 57, Nov. 1953, p. 58-61.

Describes several types of boilers properly designed for securing greatest advantages in maintenance, efficiency, and lower operating costs. Graphs, photographs, diagrams.

2037 Why Airplanes Cost More and More. J. W. Barton. *SAE Journal*, v. 61, Nov. 1953, p. 44-47; disc., p. 47.

Includes graphs.

2038 Uranium-Mining Operations of the Utex Exploration Co. In the Big Indian District, San Juan County, Utah. Charles A. Steen, George P. Dix, Jr., Scott W. Hazen, Jr., and Russell R. McLellan. *U. S. Bureau of Mines, Information Circular* no. 7669, Oct. 1953, 13 p.

Discusses development and production methods. Tables, maps, photographs.

2039 Estimate of Known Recoverable Reserves of Coking Coal in Allegheny County, Pa. Joseph J. Wallace, James J. Dowd, John M. Provost, R. F. Abernethy, and D. A. Reynolds. *U. S. Bureau of Mines, Report of Investigations* no. 5003, Sept. 1953, 16 p. (TN21 Un3r)

Presents an estimation of known measured and indicated recoverable reserves, upgrading marginal coals, and carbonizing properties of coals and coal blends not now used for making metallurgical coke. Tables, maps. 12 ref.

Books and Miscellaneous Publications

2040 Cost and Production Functions. Ronald William Shephard. 104 p. 1953. Princeton Univ. Press. (HB172 Sh48c)

Covers the process production function; Heuristic principle of minimum costs; producer's minimum cost function; dual determination of production function from cost function; geometric interpretation of the duality between cost and production function; constraints on the factors of production; homothetic production functions; the Cobb-Douglas production function; the problem of aggregation; and the dynamics of monopoly.

2041 Demand Analysis. Herman Wold and Lars Juréen. 358 p. 1953. John Wiley & Sons, Inc., New York. (HB801 W83d)

A study of the statistical methods employed in the stochastic approach to economics.

See also:

1449 (fertilizer control laws)
1607 (cost reduction in petroleum refining)
1610 (markets for synthetic phenol)
1860 (costs of operating hydroelectric stations)
1865 (efficiency of power distribution)
1969 (economic feasibility of computers)
2134 (cost savings in printing make ready)
2215 (economics of packaged compressor plants)
2229 (cost of cast iron process vessels)
2257 (economics of steel production)
2263 (costs in sintering iron ores)
2309 (efficient casting production)
2327 (tooling costs)
2411 (reduction of extrusion costs)
2434 (forging costs)
2666 (reducing costs of rubber molding)
2668 (company growth)
2689 (cost of heat pump operations)
2727 (reduction of welding costs)
2733 (costs of fan and blower elements)

FLUID MECHANICS

2042* On the Observation of Streamlines in Radial Flow Impellers. (English.) J. Gruber and M. Blahó. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 1-2, 1953, p. 29-42.

An impeller with a rear plate of Plexiglas was constructed into which smoke was conducted through a thin pipe. The streamline rendered visible by the smoke was then observed and photographed.

2043 Demonstration of Parabolic Velocity Distribution in Laminar Flow. Alexander Kolin. *American Journal of Physics*, v. 21, Nov. 1953, p. 619-620.

Describes an electrochemical method of visualizing laminar flow. Photographs, diagrams, graph.

2044* Some Aspects of the Application of Cyclone Separators to Open-Cycle Gas Turbines Burning Ash-Forming Fuels. D. B. Leason. *British Coal Utilization Research Association*, v. 17, Aug. 1953, p. 309-319.

Describes straight-through and reverse-flow types of cyclone separators. Discusses factors affecting performance. Suggests further study for improving efficiency. Diagrams. 26 ref.

2045* The Fundamental Laws of Fluid Mechanics in Tensor Representation and the Application to the Theory of Turbo-Machines. L. S. Dzung. *Brown Boveri Review*, v. 40, no. 8, Aug. 1953, p. 321-330.

Fundamental equations of fluid mechanics are derived from the conservation laws of mass, momentum, and energy. Diagrams. 7 ref.

2046 Flow and Fan. Principles of Moving Air Through Ducts. XI. Fan Selection and Rating. C. Harold Berry *Heating and Ventilating*, v. 50, Nov. 1953, p. 88-93.

Discusses criteria to be observed in selection and demontables for rapid calculation of the orifice coefficient. Diagrams, tables. (To be concluded.)

2047* The Rotation of an Infinite Plan Lamina in a Viscous Compressible Fluid. S. D. Nigam. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Aug. 1953, p. 116-119.

A mathematical analysis.

2048* Calculation of Liquid Flow Coefficients. Richmond M. Voils. *Instruments*, v. 26, Nov. 1953, p. 1731-1732, 1734-1735.

Basic flow equations are derived with the five correction factors required. Two examples illustrate use of the SCMA tables for rapid calculation of the orifice co-efficient. Diagrams. 4 ref.

2049 Observation of Shock Formation and Growth. Alfred B. Leponsky and Raymond J. Emrich. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1383-1388.

Experiments report continuous compression waves were produced in a tube by moving a piston. Shocks forming and growing from the waves were measured. Graphs, diagrams.

2050 Interferometric Studies of Supersonic Flows About Truncated Cones. J. H. Giese and V. E. Bergdolt. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1389-1396.

Density distributions have been determined. Comparisons have been made with theoretical predictions. Graph, photograph.

2051 The Structure of Shock Waves in the Continuum Theory of Fluids. D. Gilbarg and D. Paolucci. *Journal of Rational Mechanics and Analysis*, v. 2, Oct. 1953, p. 617-642.

Explores the consequences and potentialities in the theory of the steady one-dimensional shock profile. Graphs, tables. 14 ref.

2052 On Small Disturbances of Plane Couette Flow. Wolfgang Wasow. *Journal of Research, National Bureau of Standards*, v. 51, Oct. 1953, p. 195-202.

Mathematical analysis. Graphs. 18 ref.

2053 Optical Techniques for Fluid Flow. Norman F. Barnes. *Society of Motion Picture and Television Engineers, Journal*, v. 61, Oct. 1953, p. 487-511.

A basic optical and photographic description is given of schlieren, shadowgraph, and interferometer techniques in flow studies of fluids. Diagrams, photographs. 219 ref.

2054 Transport of Momentum, Mass, and Heat in Turbulent Jets. Lloyd G. Alexander, Thomas Baron, and Edward W. Comings. *University of Illinois Bulletin, (Engineering Experiment Station Bulletin Series* no. 413,) v. 50, no. 66, May 1953, 88 p. (Tl I6b)

Discusses obtaining and correlation of information on mixing in fluid streams. Emphasis was placed on measurement of momentum transport in turbulent flow. Tables, graphs, photographs, diagrams. 76 ref.

2055 Counting Methods and Equipment for Mean-Value Measurement in Turbulence Research. H. W. Liepmann and M. S. Robinson. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3037, Oct. 1953, 49 p. (TL570 Un3t)

Applications to the measurement of probability distributions of axial velocity fluctuation and its derivative in isotropic turbulence are shown. Graphs, diagrams. 14 ref.

2056 Analogy Between Mass and Heat Transfer With Turbulent Flow. Edmund E. Callaghan. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3045, Oct. 1953, 19 p. (TL570 Un3t)

An analysis of combined heat and mass transfer from a flat plate has been made in terms of Prandtl's simplified physical concept of the turbulent boundary layer. Graphs, diagram. 5 ref.

2057* Principles of Catalyzed Gaseous Reaction Rates and Their Applications. (English.) Olaf A. Hougen. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, p. 479-496.

Methods of correlating and using kinetic data have proven useful in many cases of reactor design and operation. Graphs, tables, diagrams. 46 ref.

See also:
1992 (analysis of fluid flow)
2329 (flow processes in soaking pits)

FOOD TECHNOLOGY

2058* Photoactivation and Color Formation in Antioxidant Treated Lard. L. R. Dugan, Jr., and Lotte Marx. *American Oil Chemists' Society, Journal*, v. 30, Nov. 1953, p. 452-454.

Reports results of study of factors involved in development of blue coloration. Tables. 2 ref.

2059 Flavour Assessment. H. G. Harvey. *Chemistry & Industry*, 1953, no. 44, Oct. 31, p. 1163-1167.

Discusses role of the senses of taste and smell in assisting the ordinary choice and acceptance of food. Describes tests of variations in ability for flavor assessment in different individuals. 27 ref.

2060* Dietetic Foods and the Pharmaceutical Industry. Milton A. Lesser. *Drug & Cometic Industry*, v. 73, Nov. 1953, p. 610-611, 690, 692-697.

Role of the pharmaceutical industry, with its reputation for integrity, high standards, and scientific know-how, becomes all the more important when it is realized that there is considerable faddism with respect to foods and dieting.

2061* Ray-Sterilizing Food Wrappers. L. L. Kempe, J. T. Graikoski, and L. E. Brownell. *Food Engineering*, v. 25, Nov. 1953, p. 55-56, 174.

Availability of fission byproducts has increased interest in applications. Organisms on heat-and-moisture sensitive papers and films can be rapidly killed by γ radiations essentially harmless to common organic packaging materials at the levels required for sterilization. Tables, photographs. 9 ref.

2062* Jet-Freezing. Newest Quick-Freeze System. Edward Simons. *Food Engineering*, v. 25, Nov. 1953, p. 57-61, 136-140.

Discusses in detail economics, performance, and test procedures. Photographs, diagrams, graphs, table. 12 ref.

2063* No-Hold Pasteurization Makes Progress. Franklin W. Barber. *Food Engineering*, v. 25, Nov. 1953, p. 62-63.

Discusses problems involved in elimination of holding times for the improvement of quality and economy in dairy plant operations. Tables, graph.

2064* Pace-Setting 2-in-1 Plant Quadruples Output in Seven-Phase Advance. John V. Ziemba. *Food Engineering*, v. 25, Nov. 1953, p. 72-75.

Describes a unique "twin-bakery" constructed so as to solve future expansion problems and at the same time improve quality and sanitation. Photographs.

2065 Chemistry—An Answer for Tomorrow's' Problems. Harry F. Miller. *General Electric Review*, v. 56, Nov. 1953, p. 40-43.

Discusses medical and technical aspects of food in an increasing population. Role of the ocean is included.

2066 Yeast, A Valuable Product From Wastes. Nandor Porges. *Journal of Chemical Education*, v. 30, Nov. 1953, p. 562-565.

Reviews composition, applications, and production.

2067* The Mechanism of the Interaction of Sulphur Dioxide With Certain Sugars. J. B. S. Braverman. *Journal of the Science of Food and Agriculture*, v. 44, Nov. 1953, p. 540-547.

Suggests that sulphur dioxide may yield an addition product only with the aldehydic open-chain form of certain sugars. Experimental results are presented here to show that the sulphonate is an open-chain compound. Graphs, tables. 16 ref.

2067a* The Vitamin-B Content of Foodstuffs Fumigated With Methyl Bromide. K. M. Clegg and S. E. Lewis. *Journal of the Science of Food and Agriculture*, v. 4, Nov. 1953, p. 548-552.

Includes tables. 13 ref.

Food Technology

2068* Aca-Catechin—A New Antioxidant for Vegetable Oils. I. S. M. Husaini and S. A. Saletore. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Sept. 1953, p. 408-410.

A large number of synthetic and naturally occurring compounds were tested for their antioxidant properties in peanut oil. Aca-catechin was found to be a highly efficient antioxidant. Tables. 23 ref.

2069 A One-Parameter Method for the Calculation of the Temperature Profile of Laminar Incompressible Boundary Layer Flow With a Pressure Gradient. J. A. Zaat. *Netherlands National Luchtvaartlaboratorium Report* F. 127, Mar. 3, 1953, 28 p. (TL526.N3 N38.5r)

Includes graphs, tables. 9 ref.

Books and Miscellaneous Publications

2070 Townsman's Food. Magnus Pyke. 212 p. 1952. Turnstile Press, London. (TP370 P99t)

Describes the technical problems and aims and policy of the food industry. Considers all kinds of food in turn and tells what they consist of, how they are processed, and how good or bad they are for us.

See also:
1470 (sugar refining)
1515 (antibiotics in cheese making)
1636 (analysis of fruit)
1689 (vitamin B_{12} in liver extracts)

FUELS AND COMBUSTION

2071 Studies on Low-Tempeature Carbonization of Peat and Peat Constitutents. (English.) Bengt Christiansson. *Acta Polytechnica (Chemistry Series)*, v. 3, no. 6, 1953, 128 p. (Tl Ac81)

Extraction of bitumen, carbohydrates, proteins, and humic matter was investigated. Tables, graphs. 188 ref.

2072 Hot-Oil Fogger for Use in Underground Vaults. Paul W. Kraemer. *American Gas Association Monthly*, v. 35, Nov. 1953, p. 18-20, 42.

Presents extensive field tests as proof of practicality of fogger installations. Diagrams.

2073* The Water-Gas Shift Reaction in Fuel Systems. II. The Reaction on Some Coal Chars and Coal Ashes. O. G. Ingles. *Australian Journal of Applied Science*, v. 4, Sept. 1953, p. 451-461.

Shows that several coal chars and ashes catalyze the water-gas reaction at 600-1000 C. Some ashes catalyzed the reverse reaction. Tables, graphs. 8 ref.

2074* Experiences With Continous Water Determination in Coking Coal. (German.) W. Klempt. *Brennstoff-Chemie*, v. 34, nos. 19-20, Oct. 21, 1953, p. 294-298.

Describes method using a condenser and factors affecting the results when methods are applied to coal. Results are evaluated. Diagrams, graphs, tables. 8 ref.

2075 Design of Oil and Combination Burners. *Brick & Clay Record*, v. 123, Nov. 1953, p. 52-54, 57.

Discusses means of atomizing and vaporizing oil and classifies various types of atomizing oil burners. Diagrams, photographs.

2076* Manufactured Gas. E. J. Burrough. *Canadian Mining Journal*, v. 74, Nov. 1953, p. 63-68.

Discusses composition and sources of several types of gas, both natural and synthetic. Predicts possible increased demand in future for coal as raw material for methane synthesis. Diagrams, table, photograph.

2077* Plants and Processes for Carbonising Briquetted Coal. R. J. S. Jennings. *Chemical & Process Engineering*, v. 34, Nov. 1953, p. 343-349.

Surveys low- or medium-temperature coal briquette carbonization practice. Shows what use has been made of carbonization products. Diagrams, photographs. 23 ref.

2078 Controlled Underground Gasification. Louis F. Gerdetz. *Coal Age*, v. 58, Nov. 1953, p. 80-81.

Suggests a system incorporating steam production and aimed at readily controlled production of high-quality gas. Diagram.

2079* British Research in Fuel Technology. *Coke and Gas*, v. 15, Nov. 1953, p. 408-414, 420.

Reviews work in progress at the Fuel Research Station and the laboratories of the British Coal Utilisation Research Association with special reference to carbonizing. Tables, diagrams.

2080* The Nature of the Vibration Stage of Flame Propagation. (Russian.) V. A. Popov. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 305-307.

A precise correlation of the theoretical curve with experimental data was not obtained. Graphs, micrograph.

2081* TPC—A Thermal Cracking Process for Producing High-Btu Gases. T. F. Loughry. *Gas*, v. 29, Nov. 1953, p. 27-30.

Discusses production of a fuel gas substitute for manufactured gas. Photographs, diagrams, tables.

2082* Heating Up New Verticals. A. F. Cottrell. *Gas Journal*, v. 276, Oct. 28, 1953, p. 256-258, 263, 264.

Describes above for a new plant with 48 retorts started 24 at a time to give efficient service for many years. Tables, graphs.

2083* The Introduction of Electronics to the Gas Industry. G. M. Rimmer. *Gas Times*, v. 77, Nov. 13, 1953, p. 225-226, 228, 233.

Investigation is far from complete but sufficient to realize that the gas industry can benefit in many ways by employing electronic techniques. Table. (To be continued.

2084* Organic Sulphur Removal. *Gas Times*, v. 77, Nov. 1953, p. 244-245.

Reviews history and objects of system developed in Fulham Research Laboratories. Diagram.

2085* Gas Quality. Combustion Behavior and Purity. (German.) Fritz Schuster. *Gas und Wasserfach*, v. 94, Ausgabe Gas, no. 19, Oct. 1953, p. 544-551.

Discusses standards and factors which effect the heating efficiency of a gas. Graphs, tables. 12 ref.

2086* Improving the Efficiency of Combustion on Travelling-Grate Stokers. J. Solari. *Institute of Fuel, Journal*, v. 26, Nov. 1953, p. 243-249.

Analyzes the difficulties posed when burning coals outside the "free-burning" range and indicates solution of the problem of excessive loss of boiler efficiency due to high carbon inclusions in the ash and grits. Diagrams, table.

2087* Estimation of the Combustibility of Coal and Peat by the Godbert Inflammability Apparatus. R. Lambie. *Institute of Fuel, Journal*, v. 26, Nov. 1953, p. 250-254.

In view of the possible use of pulverized peat as a fuel for gas turbines it has become necessary to examine the combustibility of peat from different bogs. For this purpose it is desirable to have a quick laboratory method to supplement full-scale tests, which are necessarily expensive and time-consuming. Diagrams, graphs, tables.

2088* Heat Transfer Into the Earth Surrounding an Underground-Gasification System. R. Loison. *Institute of Fuel, Journal*, v. 26, Nov. 1953, p. 255-259.

Author attempts a qualitative solution by solving three problems the conditions of which are analogous to those of an actual underground-gasification system. Graphs.

2089 The Length of Oil and Gas Flames. A. L. Cude. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 304-312.

A simple relationship between flame length and the quantities and velocities of air and fuel was deduced. The terms of the equation depend on measurements of flow, pressure, and density. Graphs, diagrams. 5 ref.

2090* Application of Modern Combustion Theory to Rational Organization of Firing Processes. (Russian.) G. F. Knorre. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk*, 1953, no. 5, May, p. 730-735.

Presents a general discussion.

2091* Gasificatin of Coal. II. A. K. Das Gupta and A. Lahiri. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Sept. 1953, p. 409-416.

Describes fixed-bed gas generators. Diagrams, graphs, tables. 19 ref.

2092* Transformation of Natural Carbon Dioxide Gases Into Synthetic Gas. (Hungarian.) József Varga and Vilmos Hesp. *Magyar Kémiai Folyóirat*, v. 59, no. 9, Sept. 1953, p. 267-274.

Reports on investigation for the purpose of finding method of utilization for some Hungarian natural gases containing 60-70% CO_2. Proposes catalyzer containing 20% Ni, 77% aluminum oxide, and 3% Portland cement. Results with this catalyzer are outlined. Tables, graphs. 13 ref.

2093 Liquid Desiccant Dehydration Plants. J. A. Gordon. *Petroleum Engineer*, v. 25, Nov. 1953, p. A74, A77, A80-A81, A83, A86.

Particular problems facing operations of natural gas dehydration units are presented. Sucessful remedies are given. Graphs, diagram. 8 ref.

2094 Choose Right Oil and Gas Burners. Paul R. Unger. *Power Engineering*, v. 57, Nov. 1953, p. 78-80, 102.

Presents practical tips on oil and gas burners, fuel-air ratio, and features of good control. Presents specific cases of firing oil and gas separately, together, and with coal. Photographs, diagrams.

2095* Accelerated Determination of TEL in Fuels. (Italian.) M. Faieta. *Rivista dei Combustibili*, v. 7, no. 9, Sept. 1953, p. 547-553.

Describes rapid and precise method applicable to all types of leaded fuels. Photographs.

2096* Developing Aviation Fuels and Lubricants. C. B. Davies. *Royal Aeronautical Society, Journal*, v. 57, Nov. 1953, p. 700-708.

Suggests research and development work necessary to improve existing products and to anticipate demands for new products facilitating the advance in efficiency and performance of aircraft, Tables, graphs, photographs, diagrams.

2097 Gasification of Lignite in a Commercial-Scale Pilot Plant. Progress Report Jan. 1, 1949 to June 30, 1950. A. C. Burr, R. C. Ellman, J. J. Hoeppner, J. C. Holtz, T. W. Kamps, W. R. Kube, O. C. Ongstad, and W. H. Oppelt. *U. S. Bureau of Mines, Report of Investigations* 4997, Oct. 1953, 48 p. (TN21 Un3r)

Establishes technology and economy of gasification of lignite in an externally heated metal annular retort. Tables, graphs, diagrams, photographs, micrographs. 7 ref.

2098 National Annual Diesel-Fuel Survey, 1953. O. C. Blade. *U. S. Bureau of Mines, Report of Investigations* no. 5008, Oct. 1953, 24 p. (TN21 Un3r)

Survey includes 278 samples of diesel fuel. Fourteen laboratory tests were used to analyze these samples. Graphs, tables. 11 ref.

Books and Miscellaneous Publications

2099 Brown Coal. Its Mining and Utilization. P. L. Henderson, editor. 351 p. 1953. Melbourne Univ. Press, Victoria, S. E. Australia. (TP329 H38b)

A series of Post-Graduate lectures delivered in the school of Engineering, Univ. of Melbourne. Includes: "The Background of Brown Coal Development", R. S. Andrews; "The Nature of Brown Coal", A. B. Edwards; "Distribution of Brown Coals", A. B. Edwards; "The Mining of Brown Coal", W. M. Morgan; "The Utilization of Raw Brown Coal for Steam Generation", F. H. Roberts; "Briquetting of Brown Coal", G. E. Baragwanath; "Use of Brown Coal and Briquettes in Victorian Industry", H. P. Reinbach; "The History of Pressure Gasification of Brown Coal", E. A. Bruggemann; "Research at the University of Melbourne on Lurgi Gasification of Brown Coal", F. J. Bromilow; and "Gasification of Coal in Fluid Beds", R. W. Urie.

See also:
1648 (trace elements in fuel oil)
1765 (powdered Mg as engine fuel)
1996 (costs in gas systems)
2197 (combustion control for steam plants)
2334 (fuel for heat treatment)
2544 (materials handling in gas works)
2545 (materials handling systems for coke ovens)

GEOLOGY AND MINERALOGY

2100* Disposition of Evaporites. P. C. Scruton. *American Association of Petroleum Geologists, Bulletin*, v. 37, Nov. 1953, p. 2498-2512.

Correlates characteristics of salt-depositing evaporating pans and hydrographic conditions in estuaries to infer a depositional sequence of evaporites which explains some features of known beds. Diagrams, tables. 44 ref.

2101* Sources of Error in the Measurement of Rotation Properties With the Ore Microscope. Eugene N. Cameron, Richard W. Hutchinson, and Lewis H. Green. *Economic Geology*, v. 48, Nov. 1953, p. 574-590.

Investigates optical system of ore microscope with purpose of evaluating various sources of error in measurement of rotation properties. Diagrams, graphs, tables. 10 ref.

2102 Secondary Enrichment and Microscopic Intergrowth of Copper Ores From the Akayama Mine, Yamagata Prefecture, Japan. (English.) Tsunehiko Takeuchi and Matsuo Nambu. *Science Reports of the Research Institute, Tohoku University*, Series A, v. 5, no. 1, Feb. 1953, p. 63-70.

Includes micrographs.

GEOPHYSICS

2103 V-2 Rocket in Upper Atmosphere Research. Charles F. Green. *Aero Digest*, v. 67, Nov. 1953, p. 20-26.

A review of experience at White Sands Proving Ground. Discusses preparation of rockets for firing, firing procedures, and performance of rockets after firing. Photographs, graph.

2104* The Structure of the *F* Region of the Ionosphere. A. A. Weiss. *Australian Journal of Physics*, v. 6, Sept. 1953, p. 291-303.

Effects of temperature cycles, of a decay coefficient nonuniform with height, and of vertical tidal drifts, are considered. 12 ref.

2105* Printing Made Easy With New Direct-Image Offset. *Canadian Printer and Publisher*, v. 62, Nov. 1953, p. 40, 43, 46.

The d-i-Offset process is rated as a boon to those who print from standing type and cuts or mixed pages of old and new matter.

2106* Short-Period Disturbances of the Earth's Electromagnetic Pole. (Russian.) V. A. Troitskaia. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 241-244.

Maximum frequency of vibrations was found to occur between 18 and 19 hr. of world time. The cause is due to a charged corpuscular flow radiated by the earth and focused by the earth's magnetic field. Graphs. 4 ref.

2107* Measurement of the Electrical Conductivity in the Upper Air by Radiosonde. S. P. Venkiteshwaran, B. K. Gupta, and B. B. Huddar. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Aug. 1953, p. 109-114 + 2 plates.

Describes equipment and techniques. Photographs, diagrams. 14 ref.

2108 The Gold Content of Sea Water. Garth L. Putnam. *Journal of Chemical Education*, v. 30, Nov. 1953, p. 576-579.

Summarizes gold content as determined by various investigators. Presents results of experiments to determine the solubility of gold in sea water. Photographs, tables. 35 ref.

Geophysics

2108a Measurement of Variations in Atmospheric Refractive Index With an Airborne Microwave Refractometer. Howard E. Bussey and George Birnbaum. *Journal of Research, National Bureau of Standards,* v. 51, Oct. 1953, p. 171-178.
Discusses experimental studies and indicates possible sources of error. Photographs, tables, charts. 16 ref.

2109* Ionospheric Data—June 1953. Characteristics of the Ionosphere Over Calcutta. S. S. Baral, R. K. Mitra, R. B. Banerji, A. K. Saha, M. Ghosh, B. Chatterjee, and M. R. Kunda. **Characteristics of the Ionosphere Over Ohmedabad.** K. M. Kotadia and R. G. Rastogi. *Journal of Scientific & Industrial Research,* v. 12, sec. A, Sept. 1953, p. 407-409.
Includes graphs, tables.

2110 Atmospheric Effects on Cosmic-Ray Intensity Near Sea Level. S. Olbert. *Physical Review,* v. 92, ser. 2, Oct. 1953, p. 454-461.
Effects of temperature and pressure on μ-meson intensity were studied. Graphs. 9 ref.

2111 Direction-Finding Studies of Large-Scale Ionospheric Irregularities. E. N. Bramley. *Royal Society, Proceedings,* v. 220, ser. A, Oct. 22, 1953, p. 39-61.
Describes the results of directional measurements on pulse signals reflected from the ionosphere, using various frequencies in the range 2 to 15 mc. per sec. Tables, graphs. 17 ref.

See also:
2065 (food from the ocean)

GRAPHIC ARTS

2112* The Progress of Rubber and Plastic Plate Printing. Siegfried Higgins. *American Pressman,* v. 63, Nov. 1953, p. 14, 16, 40-44.
Includes tables.

2113* What Influences Drying? Charles W. Latham. *American Printer,* v. 134, Nov. 1953, p. 30-31, 50, 52, 54, 56.
Effects of ink, paper, and humidity on drying in relation to offset printing is given. Diagrams, tables, graphs. (To be continued.)

2114* Newspaper Production. John Carter. *Australasian Engineer,* 1953, Sept., p. 66-72.
A historical review covering editorial policy, management, advertising, printing, paper, and inks. Diagrams.

2115* Printing Metals. II. Leslie G. Luker. *British Printer,* v. 66, Nov.-Dec., 1953, p. 48-51.
Discusses stereo- and electro-backing alloys, and problems of impurities, remelting, and reviving. Photographs.

2116* Photographic Knowledge for the Printer. II. Photographic Variations. André Page. *British Printer,* v. 66, Nov.-Dec., 1953, p. 51-52.
Describes some less common photographic methods and techniques suitable for effective exploitation in printed matter of various kinds.

2117 Humidity Control in the Printing Plant. L. L. Covert. *Canadian National Research Council Technical Information Service Report* no. 30, Oct. 1953, 8 p. (T13 N21.7t)
Discusses trouble from static electricity, paper curling, and poor inking caused by improper humidity control. Tables. 15 ref.

2118* Dry Relief Offset on the March. Bernard Sears. *Canadian Printer and Publisher,* v. 62, Nov. 1953, p. 37-38, 46.
Dry relief offset has proven advantageous in certain special fields of printing. One of its most important improvements is the fast method of etching of Mg plates which take millions of impressions without breaking down.

2119* High-Pressure Mercury-Vapor Discharge Lamps for Photo-Printing. J. Whittemore. *Engineering,* v. 176, Oct. 30, 1953, p. 547-548.
Includes graphs, tables, photographs. 4 ref.

2120* Alkali Fastness of Printed Products. (German.) K. Hanisch. *Fachhefte für die Chemigraphie, Lithographie und den Tiefdruck,* no. 2, May 1953, p. 58-60.
Defines alkali fastness as applied to washing powder not necessarily containing alkali.

2121* Platemaking for Process Work. Paul J. Hartsuch. *Graphic Arts Monthly,* v. 25, Nov. 1953, p. 66-68, 71-72.
Shows need of close cooperation between photographer, plateman, and pressman for the production of high quality color work.

2122* Helpful Color Measurements. II. Frank Preucil. *Graphic Arts Monthly,* v. 25, Nov. 1953, p. 76, 78, 80, 82, 90.
By means of the Maxwell triangle, the hue error, grayness, and color correction factors of blue, red, and green inks are studied. Diagram.

2123* Dry Offset and Its Place in the Graphic Arts. Bernard Sears. *Inland Printer,* v. 132, Nov. 1953, p. 46-48.
Discusses technical aspects of how dry offset is made possible. Photographs.

2124* Elements of Color Process Reproduction. V. Masking and Separations from Transparencies. Andy Perni. *Modern Lithography,* v. 21, Nov. 1953, p. 59-60.
Discusses complications caused by inherent defect of the duplicate negative. Diagram. (To be continued.)

2125* Practical Sensitometry: The H and D. Curve. Stanley Goldsmith. *Modern Lithography,* v. 21, Nov. 1953, p. 71, 73, 75, 77.
Article is devoted to interpretation of the curve and its advantages to the process cameraman. Diagrams.

2126* Colour Problems in Lithographic Printing. J. H. Brittain and A. D. Lott. *Oil & Colour Chemists' Association, Journal,* v. 36, Nov. 1953, p. 601-615; disc., p. 615-618.
Discusses optical properties of inks. Graphs, tables. 6 ref.

2127* Color and Color Control in Converting. F. L. Wurzburg, Jr. *Paper Trade Journal,* v. 137, Nov. 13, 1953, p. 121-128.
Converting industry is on the threshold of an era where color will be of greater importance than ever before. Technological developments of increasing usefulness are making rapid progress. Diagrams, graphs.

2128* The Role of Printing Plates in Paper Conversion. Ben R. Preston, *Paper Trade Journal,* v. 137, Nov. 13, 1953, p. 130-132, 134-136.
Importance of plates stems from the fact that 90% of all converted paper products reach a printing press at some stage of their production. Diagrams, photographs.

2129* Manufacture of Business Forms. B. J. Staneslow. *Paper Trade Journal,* v. 137, Nov. 13, 1953, p. 212-219.
Birth and growth of a giant industry that promises a brilliant future. Photographs.

2130* Baryta Coated Photographic Paper. William A. Kirkpatrick. *Paper Trade Journal,* v. 137, Nov. 13, 1953, p. 247-250, 252.
Deals principally with the baryta coating process.

2131* Testing for the Paper Converter. E. E. Stephenson, Jr. and H. O. Wiles. *Paper Trade Journal,* v. 137, Nov. 13, 1953, p. 289-296.
Most testing involves measuring a few external qualities, from which information is inferred about sources, use characteristics, and behavior. Photographs.

2132* The ABC of Offset. XVI. Staining the Halftone. George Jos. Lenzer. *Printing Equipment Engineer,* v. 84, Nov. 1953, p. 42, 53-54.
Describes photographic contacts, blending, and mechanical shading. (To be continued.)

2133* Roto Inks. III. Inks for Rotogravure Printing. Drying, Consistency, Thinners for Proving and for Pro-

duction. Axel Lundbye. *Printing Equipment Engineer*, v. 84, Nov. 1953, p. 44, 52-53.

(To be continued.)

2134* Makeready Conference. Edgar C. Hanford. *Printing Magazine*, v. 77, Nov. 1953, p. 56-59, 65.

Research and Engineering Council of the Graphic Arts discusses pre-press operations and standardization of proceedures as keys to important time and cost savings.

2135* Getting Best Results in 3-D Work. Bart Brooks. *Productionwise*, v. 2, Nov. 1953, p. 12-14, 16.

Discusses the basic knowledge of the photographic principles that are necessary to produce a successful anaglyph.

2136* Plates on Wheels. David Saltman. *Productionwise*, v. 21, Nov. 1953, p. 32-34.

Discusses possibilities of a printing plate that moves under its own power and never wears out.

2137 Properties of Developing Agents. IV. A Coupling Reaction of Catechols. R. W. Henn and D. W. Fassett. **V. Amino-Phenylphenols. An Autocoupling Reaction.** R. W. Henn. *PSA Journal*, v. 19B, Nov. 1953, p. 146-150.

Many catechols couple with carious meta-substituted phenols and anilines. Reports relative activities of a group of phenyl-substituted aminophenols. Tables, graphs. 5 ref.

2138 Mechanism of Superadditivity in Photographic Development. T. H. James. *PSA Journal*, v. 19B, Nov. 1953, p. 156-160.

An experimental study was made of superadditivity in metol-hydroquinone, metol-hydroquinone monosulfonate, 1-phenyl-3-pyrazolidone-hydroquinone monosulfonate, 1-phenyl-3-pyrazolidone-*d*-araboascorbic acid, diaminodurene-hydroquinone monosulfonate, and metol-*d*-araboascorbic acid mixtures. 9 ref.

2139 A Method for Identifying Preignition. R. F. Winch and F. M. Mayes. *SAE Preprint* no. 47, 1953, 10 p. (TL1 Sol3p)

Describes development of procedure and equipment for detecting and measuring preignition. Diagrams, graph, photographs.

2140 A Mathematical and Experimental Foundation for Stereoscopic Photography. Armin J. Hilt. *Society of Motion Picture and Television Engineers, Journal*, v. 61, Oct. 1953, p. 461-486.

Describes system of obtaining stereoscopic motion picture based upon extensive experimental data regarding processes involved in binocular vision. Diagram, tables, graphs, photographs. 10 ref.

2141 Conversion of 16mm Single-Head Continuous Printers for Simultaneous Printing of Picture and Sound on Single-System Negative. Victor E. Patterson. *Society of Motion Picture and Television Engineers, Journal*, v. 61, Oct. 1953, p. 512-515.

Describes new rapid printing method especially useful for television news release prints. Photographs.

2142 An Improved Carbon-Arc Light Source for Three-Dimensional and Wide-Screen Projection. Edgar Gretener. *Society of Motion Picture and Television Engineers, Journal*, v. 61, Oct. 1953, p. 516-524; disc., p. 532.

Reports that the super Ventarc which has been designed to meet substantially higher illumination requirements is only limited by maximum density of radiant energy film can take. Diagrams.

2143 Method for Determining the Revolving Power of Photographic Lenses. Francis E. Washer and Irvine C. Gardner. *U. S. National Bureau of Standards Circular* 533, May 20, 1953, 27 p. (T21 Un3c)

Presents a method based on image-forming qualities. Tables, graphs, photographs, diagrams. 16 ref.

2144* Influence of the Concentration of Bromine and Hydroxyl Ions on the Photographic Properties of the Emulsion. (Russian.) A. V. Borin, Z. I. Gratsianskaia, and R. A. Podchishchalova. *Zhurnal Prikladnoi Khimii*, v. 26, no. 7, July 1953, p. 708-720.

The nature of the change of photographic properties on the dry emulsion film after lengthy storage is determined by a concentration of bromine ions in the emulsion. Tables, graphs. 20 ref.

See also:

1616 (high speed photography for chemical research)
2233 (Mg alloy for photoengraving)
2683 (air conditioning of printing plants)
2685 (air conditioning improves offset production)
2700 (printing of textiles)
2704 (printing of textiles)
2775 (conversion of parchment)

HEAT POWER

2145* The Use of Radio-Isotopes in the Measurement of Engine Wear. *Atomics (British)*, v. 4, Nov. 1953, p. 279-285.

Discusses wear of internal combustion engines. Graphs, photographs.

2146* Growth of Generating Plant at Mudgee, N.S.W. J. J. Weston. *Australasian Engineer*, 1953, Sept., p. 73-80.

Discusses history of diesel engine development in Australia. Diagrams, photographs, table.

2147* Some Limiting Factors of Chemical Rocket Motors. W. N. Neat. *British Interplanetary Society, Journal*, v. 12, Nov. 1953, p. 249-274.

Discusses effects of various propellants, combustion chamber pressure, and nozzle expansion ratio. Graphs, tables. 13 ref.

2148* Gridding the Single Vertical Photograph. John P. Remy. *Combat Forces Journal*, v. 4, Dec. 1953, p. 30-32.

Presents a way to transfer map coordinates to vertical photographs accurately and rapidly. Photographs.

2149* The Testing of Cooling Systems. J. L. Koffman. *Diesel Railway Traction*, v. 7, Nov. 1953, p. 249-252.

Discusses performance requirements and effect of air temperature on performance of cooling systems for diesel engines. Graphs. 6 ref.

2150* Applications of the Small Gas Turbine. F. R. Bell. *Engineer*, v. 196, Nov. 13, 1953, p. 627-629.

Examines characteristics of small gas turbines ranging from 30 h.p. to 400 h.p. Discusses their suitability for numerous transport and industrial applications. Diagrams, graphs, photographs.

2151 Chrysler Centralizes Plans Utilities. *Industry and Power*, v. 65, Nov. 1953, p. 76-81.

Describes modernization program including equipment and plant layout. Photographs, diagram, table.

2152 Metallurgical Aspects of the Development of Small Gas Turbines. W. L. Slosson. *Journal of Metals*, v. 5, Nov. 1953, p. 1419-1426.

Brief description of construction and operation principles of Model 502 turbine is presented. Configuration of turbine is illustrated. A basic operation diagram outlining airflow, operating temperatures, and component speeds is given. Photographs, diagram, tables.

2153* The Manufacture of Writing Inks. C. S. Harman. *Manufacturing Chemist*, v. 24, Nov. 1953, p. 463-467.

Discusses historical background, requirements of modern inks, and importance of production technique. Describes raw materials manufacture of various types. Photographs.

2154 Electronic Gating Knockmeter Promotes Combustion Studies in Full-Scale Engines. M. M. Adams. *Petroleum Engineer*, v. 25, Nov. 1953, p. C40, C42, C44.

Discusses design, operation, and specialized uses. Diagrams, photographs.

2155* Wear of Cylinder Liners of Medium and Large Marine Diesel Engines with Special Reference to Use of

Heat Power

Heavy Fuel Oil. (Italian.) G. Simonetti. *Rivista dei Combustibili*, v. 7, nos. 7-8, July-Aug. 1953, p. 453-480.

Discusses causes of wear and presents method for testing wear on liners and pistor rings. Tables, graphs, photographs.

2156* Measurement of the Profile Drag of Compressor and Turbine Cascades and the Effect of Wakes in Vibration. J. M. Stephenson, *Royal Aeronautical Society, Journal*, v. 57, Nov. 1953, p. 722-725.

A mathematical analysis. Includes diagrams, tables, graph. 8 ref.

2157 Service Experience with TCP Fuel Additive. C. R. Johnson and D. N. Harris. *SAE Preprint*, no. 41, 1953, 15 p. (TL1 Sol3p)

Discusses the problem of spark plug manufacturing as a result of deposits. Reports on evaluation programs now under way or completed. Photographs, tables, graphs. 3 ref.

2158* Pametrada Marine Gas Turbines. *Times Review of Industry*, v. 7, new ser., Nov. 1953, p. 34.

Discusses working life, blade cooling methods, and thermal distortion.

2159 Evaporation and Spreading of Isooctane Sprays in High-Velocity Air Streams. Donald W. Buhr. *U. S. National Advisory Committee for Aeronautics, Research Memorandum* E53I114, Nov. 16, 1953, 35 p. (TL782 Un3rm)

Describes an experimental investigation of the effect of combustor-inlet conditions in ram-jet engines on the evaporation and spreading of a gasoline-type fuel injected contra-stream from a simple orifice. Tables, graphs, diagrams. 7 ref.

See also:
2036 (standardized industrial boilers)
2145 (use of radio isotopes in engine wear testing)
2182 (temperature measurements in jet engines)

INFORMATION—PREPARATION AND DISSEMINATION

2160* Chemical-Biological Documentation: A New Approach. G. Congdon Wood. *AIBS Bulletin*, v. 3, Oct. 1953, p. 16-18.

Describes methods of cataloging information at the Chemical-Biological Information Center of the National Research Council, Washington, D. C.

2161 The Information Needs of the Worker Engaged in Longer Term Research: The Viewpoint of the Chemist. H. T. S. Swallow. *ASLIB Proceedings*, v. 5, Aug. 1953, p. 183-188.

Briefly discusses value of literature searches, subject indexes, and abstracting to research workers.

2162 Documentation and Informaiton Technique Services. G. Frenot. *ASLIB Proceedings*, v. 5, Aug. 1953, p. 209-214.

Discusses a documentation system based on bibliographical references, abstracts, full texts, and sysnthetical information.

2163* How Five Major Companies Use the Electronic Calculator. Herbert O. Brayer. *American Business*, v. 23, Nov. 1953, p. 18-19, 41-44.

Presents typical examples suggestive of the diversity of the functions and problems to which data-processing equipment is being put by many corporations. Photographs.

2164 The Use of Social Data by Business, Finance, and Industry. Margaret E. Egan. *American Documentation*, v. 4, Oct. 1953, p. 147-154.

Discusses changes in the communication of specialized information. Examines the reasons for the ostensible failure of the traditional professional institutions to adapt to these changes and to foresee the implications for the future.

2165 Industrial Relations. A Case of Specialized Communication Involving Several Groups. Frederick H. Harbinson and Shirley F. Harper. *American Documentation*, v. 4, Oct. 1953, p. 155-162.

Libraries are considered an integral part of research organizations. Accordingly, library functions must be adapted to new developments and take responsibility for collection, preservation, and dissemination of information.

2166 Emergence of a New Institutional Structure for the Dissemination of Specialized Information. Jesse H. Shera. *American Documentation*, v. 4, Oct. 1953, p. 163-173.

Explores the implications of increasing demands for effective means of communicating specialized information. Discusses relation to the underlying theory of librarianship, emerging institutional structure of such communications, and necessary adaptions in professional education.

2167* Instrumentation in Coal and Coke Handling. A. Linford. *Coke and Gas*, v. 15, Oct. 1953, p. 378-383.

Describes instruments for measurement and control of coke and coal in bulk. Photographs, diagrams.

2168 Information Theory. A. M. Andrew. *Electronic Engineering*, v. 25, Nov. 1953, p. 471-475.

Concept of information as a measurable quantity is explained. Unit of information is defined. Theory has applications in evaluation of efficiencies of modulation methods and in connection with nervous transmission, reaction time, and sensory prosthesis. Photograph. 23 ref.

2169 When Should a Paper Have Joint Authorship? Walton Forstall, Jr. and William F. Stokey. *Mechanical Engineering*, v. 75, Nov. 1953, p. 875-876.

Suggests that for recognition as an author of an article, an individual should have contributed substantially to ideas contained therein or have written an appreciable portion of the article or both.

INSTRUMENTATION AND LABORATORY APPARATUS

2170 Remote Tank Gaging Via Telemetering. D. N. McMillan. *Petroleum Engineer*, v. 25, Nov. 1953, p. D19, D22, D24.

Continuous gaging of deliveries to storage tanks 150 miles away was made possible through automatic electronic telemetering over carrier system. Photographs.

2171 Interference Measuring Accurate Within One Ten Millionth of an Inch. George Webber. *American Machinist*, v. 97, Nov. 23, 1953, p. 121-124.

When tool and design engineers specify dimensional tolerances that split hairs, their demand can only be fulfilled by splitting light waves. Even these must be further divided before they are fully usable. It takes the world's most accurate measuring instrument. Diagrams.

2172 Improved Method of Determining Densities of Viscous Fluids With Babcock Bottles. Richard S. Case, John B. Gregory, and Ernest Levens. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1773.

Includes tables. 7 ref.

2173* Automatic Humidity Measuring Instruments, Especially for Industrial Gases. (German.) Kurt Guthmann. *Archiv für technisches Messen*, 1953, no. 213, Oct., p. 223-226.

Describes design and operation of Siemens and Halske's electrically operated humidity recorder. Diagrams, graphs. 14 ref.

2174* Survey of Vacuum and High Pressure Gases, Micromanometers. (German.) H. Ebert and J. Gielessen. *Archiv für technisches Messen*, 1953, no. 213, Oct., p. 227-230.

Presents bibliography, tabulated information, and diagrams. 62 ref.

2175* New Methods of Measuring Temperature in Iron and Steel Industry. I. Measuring Temperature With Thermocouples. (German.) Fritz Lieneweg. *Archiv für technisches Messen*, 1953, no. 213, Oct., p. 231-232.

Discusses use of thermocouples with and without graphic recorders. Photograph, diagram. 39 ref.

2176* The Strain-Gage Method. II. Characteristics of Commercial Strain Gages. (German.) Chr. Rohrbach. *Archiv für technisches Messen*, 1953, no. 213, Oct., p. 237-240.

Discusses influence of temperature, humidity, method of attachment, and physical properties on strain-gage measurements. Graphs. 25 ref.

2177 Direct-Indicating Recording Instruments. I. S. R. Gilford. *Electrical Manufacturing*, v. 52, Nov. 1953, p. 114-121.

Graphic recorders which perform dual design function as research and development tools and as integral parts of original equipment are described. Photographs, diagrams. 10 ref. (To be continued.)

2178* Telemetry for Guided Weapons. *Engineering*, v. 176, Oct. 23, 1953, p. 518-519.

Describes time multiplex system and pulse position modulation system. Discusses their application in obtaining information on behavior of missiles in flight. Photographs.

2179 Instrumentation and Combustion Control for Small Steam Plants. William H. Pugsley. *Industry and Power*, v. 65, Nov. 1953, p. 67-71.

Describes increased efficiency and satisfactory investment returns through use of the above. Photographs, diagrams.

2180* Progress Review No. 27: Temperature Measurement. E. J. Burton and D. J. Weeks. *Institute of Fuel, Journal*, v. 26, Nov. 1953, p. 260-273.

Reviews principles, equipment, and techniques for various applications. Tables. 120 ref.

2181* Gun-Barrel Measurements Involve Rapidly Fluctuating Temperatures. J. M. Chenoweth, J. E. Brock, C. R. St. Clair, and G. A. Hawkins. *Instruments*, v. 26, Nov. 1953, p. 1714-1715, 1738.

Development of accurate gun barrels with long life at high rates of fire, required knowledge of the transient temperature distribution during firing. Diagrams.

2182* Electrical Techniques for Time Lag Compensation of Thermocouples Used in Jet Engine Gas Temperature Measurements. Charles E. Shepard and I. Warshawsky. *Instruments*, v. 26, Nov. 1953, p. 1725-1730.

Describes basic networks. Presents methods of calculating time lag.

2183* γ Spectrometer With an Improved Focusing Action. (Russian.) B. S. Dzhelepov, N. N. Zhukovskii, A. S. Karamian, and S. A. Shestopalova. *Izvestiia Akademii Nauk SSSR, Seriia Fizicheskaia*, v. 17, no. 4, July-Aug. 1953, p. 518-520.

Focusing action in instrument takes place in front of first opening and between openings. Graphs. 4 ref.

2184 Pressure Response in Supersonic Wind-Tunnel Pressure Instrumentation. Arnold L. Ducoffe. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1343-1354.

Data indicate that response time can be maintained within acceptable limits for present-day supersonic wind-tunnel installations by proper choice of geometric and dynamic parameters. Diagrams, graphs, photographs.

2185 The Open-Circuit Thermocouple. Richard D. Potter. *Metal Progress*, v. 64, Nov. 1953, p. 80-81.

Describes measurement of temperature by spot welding the thermocouple wires to the sample being studied in such a thermocouple.

2186 A New Sensitive Chemical Actinometer. I. Some Trials With Potassium Ferrioxalate. C. A. Parker. *Royal Society, Proceedings*, v. 220, ser. A, Oct. 22, 1953, p. 104-116.

A chemical actinometer has been devised whose high sensitivity and precision depends upon the spectro-photometric determination of the photolysis products of potassium ferrioxalate with 1:10 phenanthroline. Graphs, tables. 9 ref.

2187* Speed Measurement. E. A. Murphy. *Southern Pulp and Paper Manufacturer*, v. 16, Nov. 10, 1953, p. 42, 44, 46, 48.

Describes various types of tachometers for automatic control of speed in manufacturing processes.

2188* New Advances in Electron-Microscopy. (German.) Robert Seeliger. *Umschau in Wissenschaft und Technik*, v. 53, no. 21, Nov. 1, 1953, p. 660-662.

Describes correction of astigmatism in electron microscopes with the aid of stigmator electrodes. Photograph, diagrams.

2189 High-Frequency Pressure Indicators for Aerodynamic Problems. Y. T. Li. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3042, Nov. 1953, 52 p. (TL570 Un3t)

Describes three types of pressure indicators designed to combine both high-frequency response and high resolving power into one instrument. Graphs, diagrams, photographs, tables. 12 ref.

2190* X-Ray Microphotography and X-Ray Microscopy. (Russian.) D. B. Gogoberidze. *Uspekhi Fizicheskikh Nauk*, v. 50, no. 4, Aug. 1953, p. 577-599.

A medium with a smaller wavelength was developed to increase the resolving power of microscopes. Micrographs, diagrams. 43 ref.

Books and Miscellaneous Publications

2191 Instrument Engineering. v. II. Charles Stark Draper, Walter McKay, and Sidney Lees. 872 p. 1953. McGraw-Hill. (QA85 D79i)

Provides a comprehensive background of theory for the teaching and practice of measurement and control. Relevant physical principles and mathematical techniques are adapted for use on problems of all complexity levels.

2192 Instrumentation for the Process Industries, Proceedings 7th Annual Symposium, June 2, 3, 4, 1952. 66p. 1953. Instruments Publishing Co., Pittsburgh 12, Penna. (TA165 Sy68p)

Covers mainly the new advances in the field of instrumentation and instrumentation of plants typical of the Southwest. Consideration was given to the adaption of standard instruments to meet specific operating requirements.

See also:
1778 (glossmeter)
1877 (residual potentiometer noise)

LUBRICATION AND FRICTION

2193 Super Greases for Supersonics. *Chemical and Engineering News*, v. 31, Nov. 16, 1953, p. 4776.

Describes high melting point and thermal stability of arylurea silicone greases. Discusses oxidized petroleum wax as a source of saponifiable grease bases.

2194* On the Near-the-Wall Effect and Viscosity-Temperature Properties of Na-Lubricants. (Russian.) V. V. Sinitsyn and G. V. Vinogradov. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 315-317.

With homogenization the viscosity of the lubricant decreases and reciprocal granular movement is facilitated. Tables, graphs. 4 ref.

2195* Investigation of Interdependence of Friction Forces and Sticking by the Method of Crossed Threads. (Russian.) S. B. Ratner, B. V. Deriagin, and M. F. Futran. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1137-1140.

Smoothness of threads and nearly perfect point contact permit exact measurement of friction and sticking force. Diagram, graphs. 9 ref.

2196* Wire Rope Needs Proper Lubricants. *Marine Engineering*, v. 58, Dec. 1953, p. 79-80.

Corrosion wear, caused by internal friction of strands and external contact with blocks and guides, creates the necessity of careful and adequate lubrication. A list of requirements for wire-rope lubricants is given. Photograph.

2197* Industrial Friction Materials for Modern Machinery. Tom Bell. *Pit and Quarry*, v. 44, Nov. 1953, p. 114-115, 124.

Presents general discussion of clutches and brakes including

Lubrication and Friction

definitions, history, ingredients, types of brake linings and clutch facings, and recommendations for use. Photographs.

2198* Proper Lubrication is No. 1 Problem in Ball Bearing Maintenance. W. E. Poole. *Plant*, v. 8, Nov. 1953, p. 42-45.

Presents article based on AFBDA Bearing Maintenance Report, published by The Anti-Friction Bearing Distributors Association of Cleveland. Discusses advantages and disadvantages of grease and oil. Recommends procedures for bearing maintenance including cleanliness in handling and storage, cleaning bearings and housings, and dangers of overgreasing. Photographs, diagrams.

2199* The Study of Lubricating Oils Under Extreme Pressure by Means of the Four Ball Testing Machine. (Italian.) A. Girelli, C. Paleari, and C. Siniramed. *Rivista dei Combustibili*, v. 7, nos. 7-8, July-Aug. 1953, p. 481-498.

Discusses practical significance of results obtained. Reports results of experiments on rear axle and gear box lubricants and cutting fluids. Tables, graphs.

2200 A Low Temperature Sludging Test. J. G. McNab, M. E. Conn, D. S. McArthur, and K. L. Stehle. *SAE Preprint* no. 48, 1953, 14 p. (TL1 Sol3p)

Describes method of measuring the sludge handling ability of lubricants in terms of time required to reach 50% oil screen plugging. Tables, graphs, photographs. 6 ref.

2201 Aircraft Turbine Engine Synthetic Lubricants and Their Lubricating Properties. Robert L. Johnson, Max A. Ewikert, and Edmond E. Bisson. *SAE Preprint* no. T18, 1953, 15 p. (TL1 Sol3p)

Most synthetics including a diester, a polyether, a silicate ester, and a phosphonate ester are more effective boundary lubricants at high sliding velocities than petroleum oils of comparable viscosity at 100 F. Tables, diagrams, graphs, micrographs. 11 ref.

2202* Turbine Oils and Turbine Lubricating Oil Systems. II. Speed Governor and Emergency Control Systems. G. H. Clark. *Scientific Lubrication*, v. 5, Nov. 1953, p. 10-14, 16-17.

Describes design and operating characteristics. Diagrams, photographs. (To be continued.)

2203* Application of Siloxanes as Antifoam Additives to Lubricating Oils. (Russian.) Iu. G. Mamedaliev, A. M. Kuliev, and L. S. Mustafaev. *Zhurnal Prikladnoi Khimii*, v. 26, no. 8, Aug. 1953, p. 854-859.

Best results were obtained with ethylsiloxanes. Tables, diagrams. 11 ref.

See also:
2096 (lubricants for aircraft)
2632 (lubricants for molding plastics)

MECHANICAL ENGINEERING

2204* Fatigue Life of Thick-Skinned Tension Joints. Edward W. Thall, Jr. *Aeronautical Engineering Review*, v. 12, Nov. 1953, p. 37-46.

Describes tests which were run on number of test panels representing various splice designs, to determine ways of improving life of joint. Diagrams, photographs, graph.

2205* Basic Theory of Automatic Control. C. W. Bowden, Jr. *American Oil Chemists' Society, Journal*, v. 30, Nov. 1953, p. 544-554.

Reviews various applications of automatic control. Predicts growth of contemporary trend toward more automation. Photographs, diagrams.

2206* Pumps, Their Selection and Installation. W. D. Harris. *American Oil Chemists' Society, Journal*, v. 30, Nov. 1953, p. 579-582.

Design of various types of pumps, principles of operation, and operating characteristics are given. Suggests factors to be considered in pump selection. Graphs, diagrams. 5 ref.

2207 New Air Brake System for Lightweight Vehicles. *Automotive Industries*, v. 109, Nov. 1, 1953, p. 56-57.

Basic arrangement of the braking system includes a recommended reservoir capable of providing sufficient air pressure in event of engine failure. Describes mechanism. Photographs.

2208 Essentials of Valve Construction. E. Wolff. *Canadian Chemical Processing*, v. 37, Oct. 1953, p. 64, 66, 68, 70.

Discusses common essential components of various types of valves. Diagrams, graph.

2209 Tape-Controlled Machines. Lawrence R. Peaslee. *Electrical Manufacturing*. v. 52, Nov. 1953, p. 102-108.

Reports that any number of machine motions and on-off operations can be programmed through complete cycle from magnetic tape, using record play-back techniques and servo principles. Photographs, diagrams. 11 ref.

2210* Correcting and Preventing Compressor Piping Vibrations. N. H. Moerke and C. Newman. *Gas*, v. 29, Nov. 1953, p. 88-92, 94, 96.

Discusses mechanism of vibrations in piping systems, causes, results, and possible correction. Diagrams, graphs, photographs. 20 ref.

2211 Shrink Fits. Holding Power Can Be Increased. Bernard Trock. *Iron Age*, v. 172, Nov. 12, 1953, p. 175-177.

Surface finish, radial pressures, and time have been found to be important factors in the holding power of shrink fits. Tables, graph, diagram.

2212 Automation Increases Production of Stampings at Oldsmobile. Charles H. Wick. *Machinery*, v. 60, Nov. 1953, p. 202-209.

Mechanisms for automatically loading, unloading, and transferring hoods, bumpers, and other large stampings have increased productivity and greatly improved safety conditions. Photographs, diagrams.

2213 Trend Toward Automation in Automatic Weighing and Bulk Materials Handling. I. H. Richardson. *Mechanical Engineering*, v. 75, Nov. 1953, p. 865-870.

Describes progress made by specific companies in variety of industries toward fully automatic operation. Photographs, diagram.

2214 Remote Controlled Master Valves. J. N. Morrell. *Petroleum Engineer*, v. 25, Nov. 1953, p. B68, B70, B72.

Discusses use of bottled nitrogen to close valves from a safe location in case of fire or other danger. Mechanical operation is also possible. Photographs.

2215 Economics of Packaged Compressor Plants. E. S. McRoberts. *Petroleum Engineer*, v. 25, Nov. 1953, p. E4, E6, E10, E12-E13, E16.

Modern units are adaptable to gas or air compression, may be used as one or in banks of several to reduce installation and maintenance costs. Photographs, tables.

2216 Rotating Components for Automatic Control. Sidney Davis. *Product Engineering*, v. 24, Nov. 1953, p. 129-160.

Describes characteristics and applications of linear resistance potentiometers, nonlinear function generators, induction components, synchros, servo motors, speed measuring devices, and miscellaneous control components. Photographs, diagrams. 9 ref.

2217 Simplified Analysis of Complex Vibration Problems. O. C. Brewster. *Product Engineering*, v. 24, Nov. 1953, p. 161-166.

Method is based on principles of the "mobility method". Increases advantages of the technique. Diagrams. 4 ref.

2218 Design Charts for Rectangular Wire Helical Springs. Victor Tatarinov. *Product Engineering*, v. 24, Nov. 1953, p. 207, 209, 211.

Presents graphical method for selecting wires for springs.

2219* Determination of the Bursting Pressure of a Container From the Tensile Properties of the Metal. (French.)

Henri de Leiris and Paul Bastien. *Revue de metallurgie*, v. 50, no. 10, Oct. 1953, p. 683-696.

Use of Walmsley's theory for critical stress is discussed. Calculated and experimental data are compared. Diagrams, tables. 11 ref.

2220* Plant Experiences With Pot-Galvanizing Installations for Wire. (German.) Jürgen-Echter Becker. *Stahl und Eisen*, v. 73, no. 22, Oct. 22, 1953, p. 1385-1391.

Describes functions, operations, and results of hot-galvanizing wire plant devices. Photographs, diagrams. 6 ref.

2221* Suitable Drives for Cold-Rolling Spools. (German.) W. Eberhard Baltz. *Stahl und Eisen*, v. 73, no. 22, Oct. 22, 1953, p. 1404-1409.

Discusses problems of automatic accelerating and braking of spools. Diagrams. 5 ref.

2222 Method of Concerting Heavy Motor Vehicle Loads Into Equivalent Design Loads on the Basis of Maximum Shears. Henson K. Stephenson and Kriss Cloninger, Jr., *Texas Engineering Experiment Station, Bulletin* 131, July 1953, 196 p. (T21 T31b)

Maximum stresses produced by heavy motor vehicles on various length bridge spans provide the means for comparing the stress producing characteristics of various vehicles. Tables, graphs.

2223 Stress Producing Effects of Equivalent Design Loads on Modern Highway Bridges. Henson K. Stephenson and Kriss Cloninger, Jr. *Texas Engineering Experiment Station, Bulletin* 132, Aug. 1953, 82 p. (T21 T31b)

Presents an accurate method for determining the degree of overstress that would be produced at some critical point in a given highway bridge by any heavy vehicle. Tables, graphs.

2224* Power Transmission on Modern Rotary Rigs. M. L. Rizzone. *World Oil*, v. 137, Nov. 1953, p. 128, 130, 133-134.

Discusses friction, fluid, and electromagnetic type drives and advantages of each. Photographs, graphs, diagrams.

Books and Miscellaneous Publications

2225 Statically Indeterminate Structures. Paul Anderson. 318 p. 1953. Ronald Press, New York. (TG260 An22s)

Includes chapters on basic principles of structural analysis; deflection of beams and trusses; consistent deflections and least work; slope-deflection and moment-distribution methods; frames with different joint translations; settlement and temperature stresses; design of continuous frames; tapered and haunched members; wind-stress analysis; and space frames.

See also:
1437 (design of high speed structures)
1581 (generation of ultrasonics)
2154 (electronic gating knockmeter)
2197 (brake and clutch design)
2371 (design properties of metals)
2427 (measurement and controls in modern cold-strip mills)

METALLURGY

2226* A Process for the Recovery of Manganese From Open Hearth Slags. I. Development of a Process. II. Technology of the Two Stage Process. H. W. Hosking and J. A. Gregory. *Australasian Engineer*, 1953, Sept., p. 44-55.

First stage is carried out under acid conditions and produces a high-phosphorus iron. Second reduction uses phosphorus-free slag from first stage and produces a manganese-rich alloy and a slag virtually free of metallic oxides and phosphorus. Graphs, diagrams, table. 14 ref.

2227* Recent Advances in Light Alloys. F. A. Fox. *Australasian Engineer*, 1953, Sept., p. 56-65.

A review covering production, alloy development, properties, and uses. Photographs, graph, table.

2228* Hafnium. J. Lomas. *Canadian Mining Journal*, v. 74, Nov. 1953, p. 80-81.

Presents a discussion of discovery and properties.

2229* Cast Iron Process Vessels. H. P. Voznick. *Chemical Engineering Costs Quarterly*, v. 3, Oct. 1953, p. 97-111.

Describes application and advantages of cast iron for covers, jackets, heaters, and agitators. Gives example of cost elimination. Photographs, tables, graphs.

2230* The Use of Steel Sheet for the Construction of Shielded Rooms. A. M. Intrator. *Communication and Electronics*, 1953, Nov., p. 599-604; disc., p. 604-605.

Principles of shielding are reviewed. Details of design and construction are given for rooms to be used in making low-levle electronic or electrical measurements. Photographs, diagrams, graphs. 3 ref.

2231 Electrical Conductivity and Density of Molten Cryolite with Additives. Junius D. Edwards, Cyril S. Taylor, Lee A. Cosgrove, and Allen S. Russell. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 508-512.

Reports experimentally determined electrical conductivities at 1000 C for cryolite containing 10% by weight NaF, CaF_2, AlF_3 and Al_2O_3. Photograph, graphs, tables. 11 ref.

2232 The Electrochemical and Electrometallurgical Industries of Canada. V. G. Bartram. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 295C-302C.

Reviews present industrial expansion. Predicts future opportunities. Tables, photographs.

2233* Magnesium Alloy and the Printer. R. S. Cox and R. V. Cannon. *Electrotypers and Stereotypers, Journal*, v. 18, Oct. 1953, p. 300, 303.

Reports that British-made "Primag" is now available as alternative to Cu and Zn for photoengraving. Table.

2234 Brand New Plant for Secondary Smelting. William J. Fadden, Jr. *Engineering and Mining Journal*, v. 154, Nov. 1953, p. 72-77.

Describes equipment, plant layout, and operating procedures for smelting Al, brass, Pb, and Zn scrap. Photographs, diagrams.

2235* New Structural Steels. (Polish.) Tadeusz Malkiewicz. *Hutnik*, v. 20, no. 10, Oct. 1953, p. 203-207 + data sheet.

Presents new standards for common carbon steels of ordinary and increased strength. Describes alloyed structural steels, designation of steels, and advantages from introduction of new standards. Tables.

2236 Programs Underway to Increase U. S. Production of Strategic Beryllium. B. H. Clemmons and James S. Browning. *Journal of Metals*, v. 5, Nov. 1953, p. 1433-1434.

Discusses occurence, production and consumption, uses, and processing of Be.

2237 Specialized Propeller Production. *Metal Industry*, v. 83, Oct. 23, 1953, p. 335-338.

Describes equipment, plant layout, and operating procedures of foundry engaged almost exclusively in production of ships' propellers. Photographs.

2238 The British Iron and Steel Research Association. *Metallurgia*, v. 48, no. 288, Oct. 1953, p. 178-180.

Discusses conservation and recovery of such materials as zinc and sulphuric acid, continuous measurement of strip gauge during rolling, inspection of wire dies, and improved crane controller layouts. Photographs.

2239 The British Non-Ferrous Metals Research Association. E. C. Mantle. *Metallurgia*, v. 48, no. 288, Oct. 1953, p. 183-186.

Discusses Cu, Ni, Al, Mg, Pb, and Sn, and their alloys; Zn and galvanizing; and chemical and electrochemical finishes. Photographs. 26 ref.

2240 A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging*, v. 20, Oct. 1953, p. 447-454.

Defines terms from "iron" to "joints". Photographs, diagrams, tables, graphs. (To be continued.)

Metallurgy

2241 The Platinum Group Metals. *Metal Treatment and Drop Forging*, v. 20, Oct. 1953, p. 472-478.

Discusses discovery and sources of Pt ores, physical properties, corrosion resistance, effect of heating in air, electrical resistance, and thermo-electric and catalytic properties. Tables, graphs.

2242* Reclaiming Melts of High-Speed Steel Waste in an Electric Arc Furnace. (Polish.) K. Radzwicki. *Prace Instytutow Ministerstwa Hutnictwa*, v. 5, no. 3, 1953, p. 113-118.

Discusses reclaiming melting entirely without oxidizing and with partial oxidizing. Describes advantages of adding high-speed steel cinder to the charge. Tables. 7 ref.

2243* Resistance Strips of Inmet Alloy. (Polish.) Z. Misiolek. *Prace Instytutow Ministerstwa Hutnictwa*, v. 5, no. 3, 1953, p. 119-122.

Presents methods for melting, casting, hot and cold working, and heat treating. Investigations showed that Inmet alloy strips met all requirements for resistance materials and are suitable for precision resistors. Tables, graph. 3 ref.

2244 High Purity Metals. Daniel J. Maykuth. *Product Engineering*, v. 24, Nov. 1953, p. 186-190.

Mechanical and physical properties of highly refined Zn, Al, Fe, Mo, Cr, Ti, and Zr have led to new and often unexpected applications. Tables, charts, photographs. 4 ref.

2245 The Recovery of Zinc From Galvanizers' Dross. M. L. Hughes and R. Humphreys. *Sheet Metal Industries*, v. 30, no. 319, Nov. 1953, p. 955-966, 968.

Describes sources of dross, amount produced under various conditions, and methods employed for recovery of Zn. Tables, micrographs. 20 ref.

2246* High-Heat Influence on Aircraft Design. DC-7 Uses Titanium on Nacelle Structure. E. H. LaBombard. *Western Metals*, v. 11, Nov. 1953, p. 45-48.

Discusses problems encountered due to increased operating temperatures of high-speed airplanes. Photographs, graphs, diagrams.

2247* Ductile Iron as Die & Mold Castings Offers Hardening, Welding, Machinability Advantages. Morris Asimow. *Western Metals*, v. 11, Nov. 1953, p. 50-53.

Discusses composition, microstructure, and desirable characteristics. Photographs, graph.

See also:
2115 (printing metals)

METALS—EXTRACTION AND REFINING

2248* Production of Lead Refined to 99.99+ Per Cent at the Institute of Technical Research. (Portuguese.) Tharcisio D. de Souza Santos. *ABM (Boletim da associacoa brasileira de metais)*, v. 9, no. 31, Apr. 1953, p. 235-259.

Reports details of equipment and procedures. Includes flow chart. 10 ref.

2249 Concentrating and Dissolving Platinum Metals. F. E. Beamish and W. A. E. McBryde. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1613-1617.

Reports of the efficiency of the fire assay for Ru, Os, Rh, and Ir. Table. 19 ref.

2250 The Status of Continuous Casting At Allegheny Ludlum. W. B. Pierce. *Blast Furnace and Steel Plant*, v. 41, Nov. 1953, p. 1301-1306.

Describes pilot plant and operating techniques.

2251* Gadolinium Rich Gadolinium-Magnesium Alloys. Production and Magnetic Properties. (French.) Francoise Gaume-Mahn. *Comptes rendus*, v. 237, no. 14, Oct. 5, 1953, p. 702-704.

Describes melting techniques. Magnetic properties were determined at temperatures between 78 and 300 K. 6 ref.

2252* Influences of Gases on the Density of Absorbed Layer of Sodium Oleate During Flotation of Certain Non-sulfide Minerals. (Russian.) I. N. Plaksin and E. M. Chaplygina. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, 301-303.

Explains the better floatability of investigated minerals. Graphs, 4 ref.

2253 Investigation of Thickening and Metal Entrapment in a Light Alloy Melting Flux. A. H. Sully, H. K. Hardy, and T. J. Heal. *Institute of Metals, Journal*, v. 82, Oct. 1953, p. 49-58 + plate VIII.

Discusses principle of fluxing and reports that upon thickening of flux with continued use, agglomeration of most metal entrapped therein may be effected by stirring. Tables, graphs, diagrams. 18 ref.

2254 Study of the Heterogeneity of Forging Ingots. (French.) P. Cattier, Ch. Dubois, J. Bleton, and P. Bastein. *Institut de Recherches de la Sidérurgie, Publications*, ser. A, no. 50, Sept. 1953, 261 p. (TS300 In7p)

Reports on a comparative study on melting and forging of steel ingots with respect to segregation and localization of inclusions and mechanical properties. Tables, graphs, micrographs. 22 ref.

2255* A Differential-Pressure Meter for Open Hearths. B. O. Smith. *Instruments*, v. 26, Nov. 1953, p. 1706-1707.

A differential-pressure meter for measurement of open-hearth furnace pressure can be installed close to the measuring point on the roof, eliminating errors due to buoyancy effects in connecting pipes. Diagrams. 4 ref.

2256 New Skinningrove Blast Furnace. H. G. W. Debenham and W. H. Tubbs. *Iron & Steel*, v. 26, Nov. 1953, p. 507-512.

Describes structural features, instrumentation, and auxiliary equipment. Photographs, diagrams.

2257 Arc Furnace Production. W. B. Wallis. *Iron & Steel*, v. 26, Nov. 1953, p. 521-523.

Reviews trends in electric furnace production of steel. Discusses design and development of furnaces, production at specific installations, and economic aspects. Photographs.

2258 Towards Faster Sintering of Ironstone. M. A. K. Grice and W. Davies. *Iron and Steel Institute, Journal*, v. 175, Oct. 1953, p. 155-160 + 1 plate.

Reports output closely related to airflow which may be increased by partial pelletizing of feed in drum mixer. Further benefit may be derived from delaying addition of coke until later stage in mixing. Graphs, table, photographs, diagram. 3 ref.

2259 Factors Controlling the Rate of Sinter Production. E. W. Voice, S. H. Brooks, W. Davies, and B. L. Robertson. *Iron and Steel Institute, Journal*, v. 175, Oct. 1953, p. 97-152 + 3 plates.

Discusses equipment, plant layout, and operating procedures. Describes quality of sinters and methods of increasing production. Diagrams, tables, graphs, photographs. 22 ref.

2260 Radiographic Studies of the Process of Sintering Iron Ores. E. Cohen. *Iron and Steel Institute, Journal*, v. 175, Oct. 1953, p. 160-166 + 6 plates.

Discusses mineralogical nature of sinters and desirable properties. Describes differences in structure and their relation to sintering process. Tables, photographs. 8 ref.

2261 Experiments on Flame Radiation in an Empty Open-Hearth Furnace. W. P. Cashmore and M. W. Thring. *Iron and Steel Institute, Journal*, v. 175, Oct. 1953, p. 177-182.

Describes procedures used to determine factors affecting radiation along flame, including steam quality and quantity and fuel temperature. Tables, graphs. 5 ref.

2262 Ironmaking from High-Sinter Burdens. G. D. Elliot, J. A. Bond, and T. E. Mitchell. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 241-247.

Describes recent work using burdens approaching 100% of sinter in the blast-furnace. Results obtained are discussed in

relation to heat balances. Comparisons are made with ore practice. Chart, tables. 9 ref.

2263 The Rating of Sinter Plants for Economic Output. R. F. Jennings. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 248-256.

Discusses major problems in designing sintering equipment to give maximum output at minimum costs. Graphs, tables. 6 ref.

2264 Effect of Chromium on the Thermodynamic Activity of Carbon in Liquid Iron. F. D. Richardson and W. E. Dennis. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 257-263.

Studies were made in the temperature range 1560-1660 C, at Cr concentrations of 10-80%. Results are expressed in terms of the activity coefficient of carbon, which is markedly lowered by the Cr. Graphs, tables. 10 ref.

2265 The Equilibrium Controlling the Decarburization of Iron-Chromium-Carbon Melts. W. E. Dennis and F. D. Richardson. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 264-266.

Limiting carbon concentrations that can be reached for various Cr contents of the melt were calculated and shown to be in agreement with experimental determinations. Graphs. 6 ref.

2266 Sinter-Plant Assessment Trials at Dagenham and at Cleveland. R. F. Jennings, E. W. Voice, P. K. Gledhill, G. C. Carter, and C. F. Ely. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 267-277.

Discusses equipment, plant layout, and operating procedures. Diagrams, tables.

2267 Effect of Mineral Additions and Moisture Control on the Sintering of Sierra Leone Concentrates. P. K. Gledhill, G. C. Carter, and C. F. Fly. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 277-279.

Includes graphs, table. 4 ref.

2268 The Mechanism of Reduction of Iron Oxides. J. O. Edström. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 289-303.

Includes graphs, diagram, micrographs. 68 ref.

2269 The Ironmaking Plant at John Summers and Sons (Shotton Works). J. F. R. Jones and A. Walker. *Iron and Steel Institute, Journal*, v. 175, Nov. 1953, p. 313-321.

Describes equipment, plant layout, and operating procedures. Diagrams.

2270 Ultra-Pure Metals Produced by Zone-Melting Technique. Earle E. Schumacher. *Journal of Metals*, v. 5, Nov. 1953, p. 1428-1429.

Describes new process in which a series of rather narrow molten zones is moved slowly along an ingot of relatively impure material. Each successive zone causes further refining. Diagram, photograph. 3 ref.

2271 Hurley Furnace and Boiler Description and Design. E. A. Slover. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1435-1441.

Describes construction details of reverberatory furnace and waste heat boilers designed for more efficient and flexible operation. Diagrams, tables.

2272 Change in Ingot Shape During Zone Melting. W. G. Pfann. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1441-1442.

Tapering of ingot as a molten zone traverses it, is described. Prevention of matter transport by inclining ingot at critical angle is shown. Diagrams. 4 ref.

2273 Preparation of Metallic Iron of High Purity. George A. Moore. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1443-1449; disc., p. 1449.

Brief review of present available methods of producing high purity iron is given. New method is presented consisting of extraction of ferric chloride by ether, reduction of ferric chloride to ferrous chloride, purification of chloride, and subsequent electrolytic deposition of metallic iron. Lists properties of iron produced by this method. Table, diagram. 15 ref.

2274 Manganese as an Indicator of Blast Furnace Slag Oxidation and Desulphurizing Power. Nicholas J. Grant, John W. Downing, and Robert J. Murphy. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1451-1454.

Describes large number of slag-metal tests which were examined regarding effectiveness of the above. Graphs, tables. 6 ref.

2275 Diffusion of Calcium Ion in Liquid Slag. Helen Towers, Michel Paris, and John Chipman. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1455-1458.

A simple radioactive tracer technique was used to measure diffusion coefficient of calcium ion in molten slags. Diagrams, graphs, photograph. 8 ref.

2276 Analysis of Molten-Zone Refining. Norman W. Lord. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1531-1533.

Process of molten-zone refining is analyzed for long ingots and many zone passages. Formulas are derived which give resultant impurity distribution in terms of finite series. Tables, diagram, graphs.

2277 Copper Refining, Rolling and Drawing. *Metal Industry*, v. 83, Oct. 16, 1953, p. 315-318.

Describes equipment, plant layout, and operating procedures. Photographs.

2278* Calculation of the Temperature of Thermal Reactions and the Effect of Preheating. (French.) Jean Venturini. *Metaux, Corrosion-Industries*, v. 28, no. 338, Oct. 1953, p. 396-405.

Describes detailed calculations for the above and for correcting the temperatures assumed for aluminothermal reductions. Practical results of such a correction in avoiding excessive volatilization and slag losses are indicated. Tables, graphs.

2279* The Sullivan Concentrator. *Mine & Quarry Engineering*, v. 19, Nov. 1953, p. 386-395.

Describes equipment, plant layout, and operating procedures. Photographs, diagrams, tables.

2280 The Mineralogy of Blast Furnace Sinter. Hobart M. Kraner. *Mining Engineering*, v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 196, 1953, p. 1114-1117.

Discusses composition of sintered iron ores. Graphs, tables. 28 ref.

2281* Impact Crushing. L. Ackerman. *Mining Magazine*, v. 89, Oct. 1953, p. 201-212.

Describes recent crushing tests on Tarkwaian and Witwatersrand quartzites and discusses results. Tables, diagrams. 12 ref.

2282* Ilmenite in Egypt. B. W. Holman. *Mining Magazine*, v. 89, Oct. 1953, p. 212-216.

Describes tests carried out on ore from Wadi-Ranga deposit. Diagram, tables.

2283* Kaiser Mills Nevada Fluorspar. *Mining World*, v. 15, Nov. 1953, p. 38-41.

Describes equipment, layout, and operating procedures of plant for milling and concentrating cryolite. Photographs, table.

2284* Tungsten Mining Corporation's Expanded Mill. Howard L. Waldron and Lewis J. Walters. *Mining World*, v. 15, Nov. 1953, p. 42-46.

Describes facilities and procedures for concentrating tungsten ores. Photographs, graph, flowsheet.

2285* From Africa Comes Cobalt. *Mining World*, v. 15, Nov. 1953, p. 48-52.

Describes Co mines, mills, and methods of concentrating Co ores. Photographs, map, graph.

Metals—Extraction and Refining

2286* Metallic Calcium Production. (Polish.) M. Orman. *Prace Instytutow Ministerstwa Hutnictwa*, v. 5, no. 3, 1953, p. 129-134.

Describes methods of production, properties, and application. Theoretical analysis of the aluminothermic process was made. Diagrams, graphs, tables, micrographs. 8 ref.

2287* Slag and Admixture Removal in Basic Open-Hearth Process. III. Sulfur. (Polish.) E. Bucko. *Prace Instytutow Ministerstwa Hutnictwa*, v. 5, no. 3, 1953, p. 143-158.

Slag basicity is described as principal factor affecting ration of distribution of S between slag and the metal. Graphs, tables. 19 ref.

2288* Slag and Admixture Removal in Basic Open-Hearth Process. Supplement to Part I. Slag. (Polish.) E. Bucko. *Prace Instytutow Ministerstwa Hutnictwa*, v. 5, no. 3, 1953, p. 159-161.

Discusses relationship between FeO, MgO, and Al_2O_3 content in slag and between the values characterizing the slag and its basicity. Graphs.

2289 Fundamental Researches on Metallurgical Treatment of Manganese Ores. I. On the Equilibrium in the Reduction of Mn_3O_4 with CO. (English.) Tomimatu Isihara and Akiichi Kigoshi. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 2, Apr. 1953, p. 172-178.

Equilibrium in the reduction, $Mn_3O_4+CO=3MnO+CO$, was studied. Diagrams, graphs. 11 ref.

2290 Studies on Pyrrhotite. I. Combustibility of Pyrrhotite. (English.) Masuteru Maruyama. *Science Reports of the Research Institutes Tohoku University*, Series A, v. 5, no. 3, June 1953, p. 208-217.

Roasting reaction rates and relations between roasting reactions and roasting temperatures were investigated. Graphs, tables.

2291 On Activities of Coexisting Elements in Molten Iron. I. The Activity of Carbon in Molten Iron. (English.) Kohi Sanbongi and Masayasu Ohtani. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 3, June 1953, p. 263-270.

Change in carbon content was determined by measuring e.m.f. in a concentration cell. Activity values were calculated and equilibrium relations in the iron-carbon-oxygen system were examined. Graphs, diagrams. 17 ref.

2292 Application of Unalloyed Steels Produced by Various Melting Processes. (German.) *VDI-Richtlinien* VDI 12-2028. 1952. 14 p. (TN730 V58e)

Report of investigation to determine possibilities of substituting special converter steel for open-hearth steel. Covers metallurgical basis, properties of converter steel, effects of finishing processes, fields of application, construction, and choice of material. Tables. 29 ref.

2293 The Properzi Process for Continuous Casting and Rolling of Aluminum Redrow Rod. Frank R. Nichols. *Wire and Wire Products*, v. 28, Nov. 1953, p. 1185-1187, 1229-1230.

Describes development of the process in Europe and recent improvements in U.S.A. Photographs.

2294 Continuous Casting of Brass. Daniel S. Ogden. *Wire and Wire Products*, v. 28, Nov. 1953, p. 1194-1195, 1246.

Describes equipment and operating procedures. Photographs.

2295* Thermodynamics of Several Reactions of Titanium Tetrachloride. (German.) A. Münster and W. Ruppert. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, p. 558-564.

Presents critical discussion of published data. Describes thermodynamic computations of titanium tetrachloride reactions with different reagents. Tables, graphs. 26 ref.

2296* Ore Beneficiation in Yugoslavia. (German.) Werner Gründer. *Zeitschrift für Erzbergbau und Metallhüttenwesen*, v. 6, no. 10, Oct. 1953, p. 388-394.

Discusses mining and concentration of Mo and Cu ores. Maps, diagrams, graphs. 4 ref. (To be continued.)

See also:
1532 (open-hearth refractories)
1590 (sintering of iron ores)

METALS—FINISHING, POLISHING, AND CLEANING

2297 Theory and Practice of Chemical Polishing. II. Processes for Light Alloys, Iron Group and Other Metals. R. Prinner. *Electroplating and Metal Finishing*, v. 6, Nov. 1953, p. 401-410.

Applications of chemical polishing to metallography and in machining are discussed. Typical polishing costs are given. Tables, graphs. 41 ref.

2298 Barrel Finishing Processes for Small and Large Die Castings. T. P. Barbicane. *Machinery (London)*, v. 83, Oct. 30, 1953, p. 866-871.

Briefly reviews tumbling operations, media for burnishing, methods of holding large components, and local protection from abrasion. Photograph, diagrams.

2299 Finishing by Tumbling. J. Lomas. *Machinery Lloyd (Overseas Ed.)*, v. 25, Nov. 1953, p. 85-87.

Reviews tumbling applications, equipment and operating procedures.

2300 Selecting Cleaning Methods. *Materials & Methods*, v. 38, Nov. 1953, p. 119-134.

Discusses the basic features of the standard metal cleaning methods to aid in selecting the method most feasible for a particular application. Tables.

2301* Cleaning and Preparation of Metals for Electroplating. VII. Final Summary on Degreasing Evaluation Tests. Henry B. Linford and Edw. B. Saubestre. *Plating*, v. 40, Nov. 1953, p. 1269-1271.

Describes new "Atomizer Test" for evaluating cleaners. Discusses sensitivity of degreasing evaluation tests. Tables. 18 ref.

2302* Burr Removal Expedited by Wet Tumbling. Harry C. Larson. *Products Finishing*, v. 18, Nov. 1953, p. 66-69.

Describes a fast operation which meets requirements on a large variety of parts. Photographs.

2303 Selection of Metal Cleaning Cycles. I. Samuel Spring. *Steel*, v. 133, Nov. 9, 1953, p. 112-114.

Final decision depends upon type of metal, soil, level of agitation, performance standards, water supply, and cleaner. Tables, photographs. (To be continued.)

2304 Selection of Metal Cleaning Cycles. Samuel Spring. *Steel*, v. 133, Nov. 16, 1953, p. 112-114.

Discusses importance of water in terms of hardness and rinsability. Reports other factors to be considered in selection of cleaner. Photographs, table.

See also:
1561 (barrel finishing of metal products)

METALS—FOUNDRY PRACTICE

2305 Flame-Set Spray Resin for Foundries. *Adhesives & Resins*, v. 1, Oct. 1953, p. 231-232.

Solutions of Catalac resin are sprayed on the surface of green sand molds and dried very rapidly. A hard finish is obtained by this treatment. Photographs.

2306* Oxidized Iron. W. J. Williams. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Oct. 1953, p. 41-44 + 1 plate.

Oxygen content of a number of taps from each of two melts was deliberately increased and chill test pieces were cast from each tap. No appreciable influence on chilling char-

acteristics that could be attributed to the treatment of the metal and the subsequent changes in oxygen content was detected. Photographs, tables.

2307* Gas Analyses of Cast Iron Produced at Various Foundries. B. B. Bach. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Oct. 1953, p. 45-70 + 1 plate.

Samples of cast iron and pig iron were taken at twelve industrial plants and the oxygen, hydrogen, and nitrogen contents determined. These results were tabulated, together with other revelant data such as melting temperature, type of furnace, etc. Some tentative conclusions were drawn. Photographs, diagrams, tables.

2308* Non-Ferrous Centrifugal Foundry. *Engineer*, v. 196, Nov. 6, 1953, p. 589.

Describes equipment, plant layout, and operating procedures in foundry designed to produce very large castings. Photographs.

2309 Quantity Production of Malleable Castings. H. Hayden. *Foundry Trade Journal*, v. 95, Oct. 22, 1953, p. 409-503; disc., p. 503-504.

Discusses design, developments, and controls all of which have considerable influence on increasing production and reducing waste. Photographs.

2310 Shell-Moulding Process. D. N. Buttrey. *Foundry Trade Journal*, v. 95, Oct. 29, 1953, p. 531-536.

Discusses present position of process and describes techniques available for making shell molds. Tables. 13 ref.

2311 "SMZ" Alloy and Its Uses as a Ladle Addition to Cast Iron. *Foundry Trade Journal*, v. 95, Nov. 12, 1953, p. 20-21.

"SMZ" alloy is suitable for any application wherein a strong graphitizing action is desired. Tables, graphs, photographs.

2312 Mechanized Shell-Moulding Plant. Hugh K. McGavock. *Foundry Trade Journal*, v. 95, Nov. 12, 1953, p. 591-593.

Description of an experimental shell-molding plant. Diagrams.

2313 High-Temperature Melting and Pouring of Gray-Iron Castings. I. Iitaka and K. Sekiguchi. *Foundry Trade Journal*, v. 95, Nov. 12, 1953, p. 603-605.

Although there are many drawbacks in high temperature operation, the authors seek to find the merits of it.

2314* Reactions on the Surface of the Mold. (German.) K. Roesch. *Giesserei*, v. 40, no. 22, Oct. 29, 1953, p. 581-585.

Discusses importance of good gas permeability and low liberation of gas. Photographs, table, graphs, micrographs.

2315 Flow Properties of Foundry Sand. J. Gittus. *Iron & Steel*, v. 26, Nov. 1953, p. 501-506.

Describes various tests for foundry sands. Analyzes results of these tests for evidence of flowability evaluation. Graphs, photographs, diagrams. 7 ref. (To be concluded.)

2316 The Fluidity of Molten Steel. B. G. Rightmire and H. F. Taylor. *Iron and Steel Institute, Journal*, v. 175, Oct. 1953, p. 167-176.

Presents a quantitative evaluation of fluid flow based on published experimental data and established hydrodynamic theory. Diagrams, tables, graphs. 25 ref.

2317 Composition Control of Steel Castings Improved by New Furnace Sampling Methods. Vincent E. Belusko. *Journal of Metals*, v. 5, Nov. 1953, p. 1430-1432.

Reports new sampling methods permit greater economic and production advantages. Photographs.

2318* Moulding Sands for Piston Ring Castings. R. M. Krishman, M. N. Khanna, and B. R. Nijhawan. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Sept. 1953, p. 417-421.

Properties of foundry sands from Great Britain were determined and compared with properties of Indian sands. Graphs, micrographs, tables.

2319 Casting Torque Converter Parts With Plaster Cores. Charles H. Wick. *Machinery*, v. 60, Nov. 1953, p. 166-171.

Describes forming of cores; preparation of molds; and pouring, cleaning, and testing of castings. Photographs.

2320 Shell-Mold Casting of Automotive Parts. James H. Smith. *Machinery*, v. 60, Nov. 1953, p. 186-195.

Describes equipment and operating procedures at General Motors' foundries. Photographs.

2321 Slush Casting of Light Alloys. *Machinery (London)*, v. 83, Oct. 30, 1953, p. 872-873.

Describes equipment and methods. Photographs.

2322 Investment Precision Casting. A. Dunlop. *Metal Industry*, v. 38, Oct. 30, 1953, p. 355-357.

Discusses process in which accurate molds are produced directly from suitable master patterns. Complications associated with wax-molding dies and wax-injection equipment are avoided and dimensional errors arising from wax shrinkage and distortion are eliminated. Photographs. (To be continued.)

2323 Investment Precision Casting. A. Dunlop. *Metal Industry*, v. 83, Nov. 6, 1953, p. 381-382.

Describes mold making and treatment of castings. Photographs.

2324 Metal Casting Methods. VII. Moulding Sands and Pattern Production. J. B. McIntyre. *Metallurgia*, v. 48, no. 288, Oct. 1953, p. 165-168.

Begins discussion of sand casting methods by reference to molding sands and their properties. Describes sand-cement molding technique and discusses patterns and their production. Photographs.

2325 The British Cast Iron Research Association. J. G. Pearce. *Metallurgia*, v. 48, no. 28, Oct. 1953, p. 175-177.

Discusses elimination of health hazards in foundry, including improved grinding wheel dust extractor unit, and other research projects. Diagram, photograph. 9 ref.

2326* Melting Practice for Investment Casting. II. Sam Tour. *Precision Metal Molding*, v. 11, Nov. 1953, p. 40-41, 83-87.

Melting contamination and losses, refractories, and crucibles are discussed. Photographs.

2327* Eight Facts to Consider in Specifying Castings. E. O. Mildebrath. *Precision Metal Molding*, v. 11, Nov. 1953, p. 47, 93-94.

Discusses costs of tooling, rough casting, machining, jigs and fixtures, and preparation of surface for finishing. Photographs, tables.

2328 Mechanization Takes Over Sand Molding. Leon F. Miller. *Steel*, v. 133, Nov. 9, 1953, p. 116.

Describes automatic molder capable of producing cylinder block halves at rate of 240 per hour and shallower molds at 300 per hour. Photograph.

See also:
2253 (melting of light alloys)
2298 (barrel finishing of die castings)

METALS—HEAT TREATMENT

2329* Model Experiments Made to Explain Flow Processes in Soaking Pits. (German.) Michael Hansen, Hans Scholtz, and Oskar J. Stebel. *Archiv für Eisenhüttenwesen*, v. 24, nos. 9-10, Sept.-Oct. 1953, p. 375-381.

Flow of gases in different furnace pit designs is described and practical observations confirmed. Graph, table, diagrams, photographs. 6 ref.

2330* Surface Hardening of Steel by Means of High Frequency Induction Heating. (French.) G. Perronne. *Chaleur & Industrie*, v. 34, no. 339, Oct. 1953, p. 279-290.

Outlines theoretical and practical aspects of the method, details of the process, and equipment necessary. Results are compared with previous data. Photographs, graphs. 28 ref.

Metals—Heat Treatment

2331* Methods of Study and Control of Heat Treatment of Steel. (Czechoslovakian.) Ladislav Jenicek and Bohdan Sestak. *Hutnické Listy*, v. 8, no. 10, Oct. 1953, p. 512-521.

Discusses magnetic measurements. Methods are described for determining the beginning of martensite transformation. Diagrams, graphs. 25 ref.

2332* Heat Treatment as a Characteristic Factor of Carbon and Alloyed Structural Steels. (Czechoslovakian.) *Hutnické Listy*, v. 8, no. 10, Oct. 1953, p. 521-528.

Discusses favorable effects of fast cooling on mechanical properties, aging resistance, and weldability. Graphs, table. 8 ref.

2333* Gas Carburizing—From Pioneer to Practical Production. John T. Mitchell and Russell Buyea. *Industrial Gas*, v. 32, Nov. 1953, p. 3-5, 24.

Describes method resulting in reduced costs, improved quality of production, and better working conditions. Photographs.

2334 Fuel Selection for Heat Treating at Caterpillar. Glen C. Riegel and Thomas Spencer. *Industry and Power*, v. 65, Nov. 1953, p. 72-75.

Discusses factors governing choice of gas or electricity. Photographs.

2335 Strict Gas Control Halts Decarb in Aircraft Tubing. W. D. Latiano. *Iron Age*, v. 172, Nov. 19, 1953, p. 154-157.

Describes annealing and normalizing operations resulting in practically no surface carbon loss. Photographs, graph, table, micrographs.

2336 Selective Flame Hardening Improves Camshaft Wear Resistance. W. G. Patton. *Iron Age*, v. 172, Nov. 12, 1953, p. 171-174.

Describes automatic unit and its advantages of versatility, safety, high production, and close control. Photographs.

2337 The Bright Annealing of Copper and Its Alloys. W. C. F. Hessenburg and E. C. Mantle. *Metal Industry*, v. 83, Oct. 16, 1953, p. 323-324.

Discusses processes for the above including use of controlled atmospheres. 4 ref. (To be continued.)

2338 The Bright Annealing of Copper and Its Alloys. W. C. F. Hessenberg and E. C. Mantle. *Metal Industry*, v. 83, Oct. 30, 1953, p. 363-364.

Describes recuperative radiant tube and open flame annealing furnaces.

2339 The Bright Annealing of Copper and Its Alloys. W. C. F. Hessenberg and E. C. Mantle. *Metal Industry*, v. 83, Nov. 6, 1953, p. 377-380.

Describes construction of annealing furnaces and effects of atmosphere composition and residual rolling lubricants on surface finish. Photographs, diagrams. 19 ref.

2340 Measurement of Case Depth. Dale J. Wright. *Metal Progress*, v. 64, Dec. 1953, p. 86-88.

Describes equipment and proecdures for a rapid, reliable, low cost test. Standard specimens are used with direct reading microscope. Photographs.

2341 Controlled Atmospheres. Their Generation and Utilization. O. E. Cullen. *Metal Progress*, v. 64, Dec. 1953, p. 101-106.

Discusses composition and uses of atmospheres for various heat treating operations.

2342* The Age-Hardening of Thin Films of Al-Ag Alloys. (German.) A. Winkelmann and H. Raether. *Naturwissenschaften*, v. 40, no. 20, 1953, p. 526.

Presents a study of precipitation hardening of vapor-deposited Al-Ag alloy with electron interferences. Results indicate that thin films reach the stable γ phase more readily than thicker layers of the alloy because of the absence of internal stresses. Diagram. 6 ref.

2343* Flame Hardening With Natural Gas. *Western Machinery and Steel World*, v. 44, Nov. 1953, p. 119-120.

Describes technique and reports that this application is practical when natural gas is mixed in proper proportion with oxygen. Photographs.

See also:
2363 (heat treatment of steel)
2406 (60-cycle induction heating)
2439 (phase hardening of iron during quenching)

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2344* Effect of Boron on Electric Conductivity of Ingot Aluminum and of Refined Metal. (Russian.) A. Domon and R. K. Vassel. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 1-2, 1953, p. 159-163.

Presents measurements of electrical conductivity of high purity and of ordinary ingot Al alloyed with B and with B and Ti. Discusses mechanism of refining with B. Graphs. 3 ref.

2345 The Heat Capacity and Entropy of Thorium From 18 to 300° K. Maurice Griffel and Richard E. Skochdopole. *American Chemical Society, Journal*, v. 75, Nov. 5, 1953, p. 5250-5251.

Experimental data are tabulated with enthalpy and Gibbs function as functions of temperature. Tables. 17 ref.

2346* The Geometry of the Pyramidal Identation in the Hardness Testing of Involute Gear Teeth. N. J. C. Peres. *Australian Journal of Applied Science*, v. 4, Sept. 1953, p. 389-394.

Presents equations for obtaining true hardness values from indentions on curved surfaces.

2347* Alloying Elements in Steel and Their Importance in Steam-Boiler Design. (German.) H. Buchholtz. *Brennstoff-Wärme-Kraft*, v. 5, no. 10, Oct. 1953, p. 358-359.

Discusses mechanical properties of different alloy steels at elevated temperatures. Graph, table.

2348* Investigation of Thin Films of Intermetallic Compounds. (Russian.) A. K. Kikoin and G. D. Fedorov. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1163-1165.

Components of a system were deposited on a plate by evaporation in a vacuum. Preparations were investigated to determine optical properties for dielectrics. Graphs, micrograph. 4 ref.

2349* The Creep Behavior of Zirconium-Alloyed Steels at 500 C. (German.) Wilhelm Anton Fischer. *Archiv für das Eisenhüttenwesen*, v. 24, nos. 9-10, Sept.-Oct. 1953, p. 397-400.

Zirconium steels quenched at 100 to 1200 C and annealed at 600 C were shown to have a lower creep strength than other special carbide-forming steels. Tables, graphs. 13 ref.

2350* A Mathematical Equation for the Stress-Strain Curve of the Tensile Test. (German.) Alfred Krisch. *Archiv für das Eisenhüttenwesen*, v. 24, nos. 9-10, Sept.-Oct. 1953, p. 401-405.

Presents a literature review and critical discussion and expansion by H. I. Fusfield's and H. Kostron's formulas to permit consideration of small tensile deformations. The tensile strength of unalloyed and alloyed steels was investigated. Tables, graphs. 19 ref.

2351 The Bending Yield Point, And Additional Characteristic of Thin Sheet Metals. (German.) Walter Fackert. *Archiv für das Eisenhüttenwesen*, v. 24, nos. 9-10, Sept.-Oct. 1953, p. 407-410.

Critically discusses earlier tests of the suitability of sheet metals for the manufacture of containers. Describes new testing device, its operation, and results. Table, graphs, photographs, diagrams.

2352* Effect of Low-Temperature Deformation on the Properties of Stainless Austenitic Steels. (German.) Karl

Bungardt, Rudolf Oppenheim, and Robert Scherer. *Archiv für das Eisenhüttenwesen*, v. 24, nos. 9-10, Sept.-Oct. 1953, p. 423-430.

Describes tests made to determine effects of low temperature (—70 and —180C) on mechanical properties, magnetic saturation, and chemical resistance. Tables, graphs, micrographs.

2353* The Influence of Surface Rolling on the Fatigue Strength of Cast Iron. G. N. J. Gilbert and K. B. Palmer. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Oct. 1953, p. 71-77 + 1 plate.

Experiments are reported on V-notched specimens of a pearlitic flake graphite cast iron. Graphs, photographs, tables.

2354* The Permeability of Silicon-Iron at Very Low Flux Densities. Eberhard Both. *Communication and Electronics*, 1953, Nov., p. 656-661; disc., p. 661-664.

Measurements were made on specimens containing 3.25% silicon and annealed at various temperatures. Graphs, tables. 6 ref.

2355* Supplementary Electrical Resistance and Thermoelectric Force Due to Vacancies in Metals. (French.) Florin Abeles. *Comptes rendus*, v. 237, no. 15, Oct. 12, 1953, p. 796-798.

Proposes a model based on the Born approximation. Results are compared with experimental values for Ag, Au, and Cu. 4 ref.

2356* Calculation of the Energy of Distortion of the Lattice of the Third Type Depending on the Magnitude of Deformation. (Russian.) N. S. Fastov. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1167-1170.

Energy of residual stresses was found to be dependent on magnitude of uniform deformation in tension or compression. Graphs. 3 ref.

2357* Investigation of the Surface Tension of the Alloy Lead-Cadmium on the Boundary With Molten Eutectics LiCl-KCl and in Vacuum. (Russian.) V. A. Kuznetsov, V. P. Kochergin, M. V. Tishchenko, and E. G. Pozdnysheva. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1197-1199.

Investigates electrocapillary phenomena of surface tension in a vacuum. All measurements were made at temperatures above 450 C. Graphs. 11 ref.

2358* Metallurgical Topics. *Engineer*, v. 196, Nov. 6, 1953, p. 592-593.

Describes bend and tensile tests on steels and experiments on steel tubes under internal pressure. Graphs, tables.

2359* The Design of Creep-Resisting Steels. E. W. Colbeck, J. R. Rait, and J. O. Ward. *Engineering*, v. 176, Oct. 23, 1953, p. 537-540.

Discusses effects of various alloying elements. Diagram, photographs, tables, graphs. 28 ref.

2360* Modification of A-S4 G by Sodium. (French.) *Fonderie*, 1953, Sept. no. 92, p. 3613-3615.

Describes experiments for determining effect of sodium additions on mechanical properties and structure of light alloys with a low silcon content. Practical implications of results are discussed. Tables, graphs, micrographs.

2361 The Effect of Iron, Manganese, and Chromium on the Properties in Sheet Form of Aluminium Alloys Containing 0.7% Magnesium and 1.0% Silicon. R. Chadwick, N. B. Muir, and H. B. Grainger. *Institute of Metals, Journal*, v. 82, Oct. 1953, p. 75-80 + IX-XIII.

Reports that after solution heat-treatment and room-temperature aging, mechanical properties varied only slightly with composition. Artificial aging increased susceptibility to intercrystalline corrosion. Table, diagrams. 16 ref.

2362 The Effect of Cold Work on An Iron-Manganese Alloy. J. Gordon Parr. *Institute Metals, Journal*, v. 82, Oct. 1953, p. 92-91.

Reports that metastable phases are produced in quantities which depend upon extent of cold working. Tables. 3 ref.

2363 How to Develop Favorable Stress Patterns. I. J. E. Campbell and H. O. McIntire. *Iron Age*, v. 172, Nov. 12, 1953, p. 185-188.

Reports favorable surface stresses can increase fatigue life and can be obtained by selection of proper steel grades, size, and heat treatment. Graphs, tables.

2364 Static Load Carrying Capacity of Steels. Effect of Heat Treatment. R. G. B. Yeo and T. Ko. *Iron & Steel*, v. 26, Nov. 1953, p. 498-500.

Investigations were made on effects of hardness of through-hardened carbon steel; and of case thickness, variation of hardness, and prequenching treatment of Krupp steel. Photographs, graphs. 6 ref.

2365 Effects of Temperature on the Flow and Fracture Characteristics of Molybdenum. J. H. Bechtold. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1469-1475.

Tensile properties of annealed Mo were investigated from 1000 to —200 C. Graphs, photographs, diagram, table. 17 ref.

2366 Bending of Molybdenum Single Crystals. K. T. Aust, R. Maddin, and N. K. Chen. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1477-1482.

Lattice rotations occurring on tension and compression sides during bending of Mo single crystals at room temperature were followed in detail. Observations were also made concerning crystallite rotation and slip traces. Crystallite fragmentation was also noted. Table, graph, photographs, diagrams. 11 ref.

2367 Kink Band Formation in High Purity Aluminum During Creep at High Temperatures. Andre M. Gervais, John T. Norton, and Nicholas J. Grant. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers Transactions*, v. 197, 1953, p. 1487-1492.

The X-ray Laue back-reflection technique was used in conjunction with metallographic studies to determine crystallographic elements involved in kinking and to measure rotations of bands. Diagrams, photographs, table. 16 ref.

2368 The Properties of Sand Cast Mg-Th-Zn-Zr Alloys. K. E. Nelson. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1493-1497.

Effect of Tr and Zn variations on strength and 100 hour creep characteristics of Mg, Th, Zn, and Zr alloys was investigated. Tables, diagrams ,photographs. 28 ref.

2369 Some Observations on the Work Hardening of Metals. E. H. Edwards, Jack Washburn, and Earl R. Parker. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1525-1529.

Mechanism of strain hardening is discussed in connection with some recent observations on stress-induced motion of dislocation boundaries and on shear deformation of Zn, Cd, and Cu crystals. Graphs. 17 ref.

2370 The Energy State of Fatigued Copper. B. Welber and R. Webeler. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1558-1559.

Reports calorimetric investigation of the above. Table, graphs.

2371 Design Properties of Metals. II. Strength in Tension. Robert L. Stedfeld. *Machine Design*, v. 25, Nov. 1953, p. 161-170.

Describes more effective use of tensile strength data. Graphs, photographs, table. 8 ref.

2372 Malleable Irons. *Materials & Methods*, v. 38, Nov. 1953, p. 137.

Tabulates composition, properties, and uses of pearlitic, standard 32510, and standard 35018 malleable irons.

2373 The Behavior of Metals Under Dynamic Loading. Donald S. Clark. *Metal Progress*, v. 64, Nov. 1953, p. 67-73.

Discusses impact and strain propagation; dynamic stress-strain

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relations; delay of plastic strain; and pre-yield microstrain. Graphs, diagrams, table.

2374 Effect of Iron on Hardness, Band Properties and Welding of Titanium Sheet. W. L. Barth and A. L. Field, Jr. *Metal Progress*, v. 64, Nov. 1953, p. 74-77.

Concludes that 0.5% iron has little effect on the room-temperature mechanical properties of commercial-purity α alloys such as RC-70, RS-70, Ti-100-A and MST Grade III, in the range of 55,000 to 70,000-psi yield strength. Graphs, tables, photograph, micrographs.

2375 Impact Properties of Annealed Spheroidal-Graphite Cast Iron. A. L. Carr and W. Steven. *Metal Treatment and Drop Forging*, v. 20, Oct. 1953, p. 455-461.

Presents abridged version of authors' contribution to International Foundry Congress, in Paris, September 19-27. Reports tests made in temperature range of —150 to +300 C. Transition temperature was found to depend on Si, Mn, and P content. Photographs, tables, graphs. 13 ref.

2376 Scratch Hardness Measurement With a Diamond Pyramid. T. Land and B. Sugarman. *Metal Treatment and Drop Forging*, v. 20, Oct. 1953, p. 464-466.

Based on paper presented before Sheet and Strip Metal Users' Technical Association. Reports comparison of scratch and indentation hardness tests. Photographs, graphs.

2377 Electrical Interaction of a Dislocation and Solute Atom. A. H. Cottrell, S. C. Hunter, and F. R. N. Nabarro. *Magazine*, v. 44, 7th ser., no. 358, Nov. 1953, p. 1236-1258. p. 1064-1067.

Motts' estimate of the effective charge was used to calculate the electrical interaction of a solute atom in Cu alloys. 11 ref. 11 ref.

2378 Stable Dislocations in the Common Crystal Lattices. E. C. Frank and J. F. Nicholas. *Philosophical Magazine*, v. 44, 7th ser., no. 358, Nov. 1953, p. 1213-1235.

On the assumption that the energy per unit length of a dislocation line is proportional to the square of the Burgers vector, the stability of dislocations in simple cubic, face-centered cubic, diamond, hexagonal close-packed, and body-centered cubic lattices is discussed. Diagrams, tables. 5 ref.

2379 The Surface Free Energy of a Metal. II. Normal State. II. Superconducting State. R. Stratton. *Philosophical Magazine*, v. 44, 7th ser., no. 358, Nov. 1953, p. 1236-1258.

A mathematical analysis. Diagrams, tables. 14 ref.

2380 Theory of Plasma Waves in Metals. Peter A. Wolff. *Physical Review*, v. 92, ser. 2, Oct. 1, 1953, p. 18-23.

Effect of the crystal lattice on plasma oscillations was investigated by Hartree approximation. Eariler works are reviewed. 14 ref.

2381 The Superconducting and Normal Heat Capacities of Niobium. A. Brown, M. W. Zemansky, and H. A. Boorse. *Physical Review*, v. 92, ser. 2, Oct. 1, 1953, p. 52-58.

Above was studied from 2.5 to 11 K. Transition temperature was found to be 8.70 ± 0.10 K. Diagrams, tables, graphs. 15 ref.

2382 The Vibrational Spectrum and Specific Heat of Sodium. E. Bauer. *Physical Review*, v. 92, ser. 2, Oct. 1, 1953, p. 58-67.

Spectrum is derived by a method suggested by Houston. Lattice part of the specific heat of metallic Na is calculated as a function of temperature. Tables, graphs. 17 ref.

2383 The Plastic Flow of Iron and Plain Carbon Steels Above the A_3-Point. P. Feltham. *Physical Society, Proceedings*, v. 66, no. 406B, Oct. 1953, p. 865-883.

Shows that the strain rate is a function of applied stress, absolute temperature, latent heat of melting, and volume per atom. Presents transient strain equation. Tables, graphs, diagrams. 31 ref.

2384 The Measurement of the Thermal Expansion of Single Crystals of Indium and Tin with a Photoelectric Recording Dilatometer. E. C. Vernon and S. Weintroub. *Physical Society, Proceedings*, v. 66, no. 405B, Oct. 1953, p. 887-894.

Dilatometer is described. Thermal expansion of two Sn and seven In crystals were measured. Crystals were made by slow solidification. Tables, graphs, diagrams. 21 ref.

2385 Surface Recombination in Germanium. W. N. Rey-Reynolds. *Phyiscal Society, Proceedings*, v. 66, no. 406B, Oct. 1953, p. 899-901.

Above was studied by carrier injection into a long Ge block swept by an electric field and operated in a variable magnetic field at a right angle. Graphs. 4 ref.

2386 Dislocations and Plastic Deformation. W. T. Read, Jr. *Physics Today*, v. 6, Nov. 1953, p. 10-13.

Reviews fundamental concepts concerning the above in certain ductile materials. Reports that small and exceedingly rare defects in structure of solids are "weak links" that determine strength of materials. Diagrams.

2387* Relationship Between Mechanical Characteristics and Texture of Directly Extruded Aluminum-Alloys. (French.) Jean Navarro and Robert Tertian. *Revue de l'Aluminium*, v. 30, no. 202, Sept. 1953, p. 299-306.

Mechanical properties were influenced more by the complex textures in non-symmetrical extrusions than by the normal textures of round and square extrusion. Photographs, diagrams, tables, micrographs. 4 ref.

2388* Relationship Between the Exact Shape of the Tensile Curve of Metals and the Simultaneous Modifications of Their Structure. (French.) Ch. Crussard. *Revue de metallurgie*, v. 50, no. 10, Oct. 1953, p. 697-710.

Observations were made on polycrystals and monocrystals of various metals. Equations are proposed for predicting the elongation at which necking begins. A new hypothesis on deformation bands is presented. Tables, graphs, micrographs. 31 ref.

2389* Observations on Pieces Cracked or Broken in Service (Crank Shafts, Helical Springs, etc.) (French.) Paul Coron. *Revue de metallurgie*, v. 50, no. 10, Oct. 1953, p. 711-724; disc., p. 724-726.

Reports on microscopic observations of cracks and fractures of cast iron and steel pieces at ordinary temperatures from mechanical causes. Method for determining cause and eliminating occurrence of service failures is proposed. Photographs. 133 ref.

2390* The Behavior of Thick-Walled Pipes Submitted to High Pressures. (French.) L. Deffet and J. Gelbgras. *Revue universelle des mines*, v. 9, ser. 9, no. 10, Oct. 1953, p. 725-740.

Various methods for measuring the distension are examined Results with mild and semi-hard steels are discussed. Photographs, tables, diagrams, graphs. 23 ref.

2391 Some Magnetic Properties of Metals. VI. Surface Corrections to the Landau Diamagnetism and the de Haas-van Alphen Effect. R. B. Dingle. *Royal Society, Proceedings*, v. 219, ser. A, Oct. 7, 1953, p. 463-477.

Reports calculations made for the above, characteristic of large systems of electrons. 13 ref.

2392 Dislocations, Plastic Flow and Creep. N. F. Mott. *Royal Society, Proceedings*, v. 220, ser. A, Oct. 22, 1953, p. 1-14 + 4 plates.

States that dislocations normally exist in crystalline solids, that they are formed during crystal growth, and that they can move when the crystal is stressed. Outlines a theory of ductile fracture based on production of piled-up dislocations. The concept of "climb" of dislocations is introduced to explain recovery and creep. Diagrams, micrographs. 60 ref.

2393 On the Magnetostrictive Constants of Face-Centered Cubic Nickel-Cobalt Alloys. (English.) Mikio Yammamoto and Ryofu Miyasawa. *Science Reports of the Research Institutes, Tohoko University*, Series A, v. 5, no. 2, Apr. 1953, p. 113-123.

An expression was derived for the saturation magneto-striction of polycrystalline specimens. Graphs. 16 ref.

2394 On the Anomaly of the Specific Heat at High Temperatures in Alpha Phase Alloys of Iron and Chromium. (English.) Hakaru Masumoto, Hideo Saito and Makoto Sugihara. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 3, June 1953, p. 204-207.

Measurements were made on quenched or annealed iron alloys, containing up to 55% Cr, at temperatures up to 900 C. Graphs.

2395 Study on High Chromium Steels. I. On the Anomaly of Alpha Solid Solution of Fe-Cr System at High Temperatures. (English.) Yonoshin Imai and Kenzaburo Kumada. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 3, June 1953, p. 218-226.

Describes experimental study to determine cause of brittleness at 475 C. Graphs, tables.

2396 On the Microhardness of Aluminium Single Crystal. (English.) Takeo Hikage. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 3, June 1953, p. 254-262.

Reports investigation on annealed Al before and after deformation by stretching. Graphs, diagrams, micrographs, tables. 5 ref.

2397 Properties of Carbon and Alloy Steels Made With Sponge Iron. J. L. Morning and W. W. Stephens. *U. S. Bureau of Mines, Report of Investigations*, no. 4975, Sept. 1953, 17 p.

Studies were made on the mechanical and physical properties of a series of steels. Tables. 7 ref.

2398 Biaxial Fatigue Properties of Pressure Vessel Steels. C. E. Bowman and T. J. Dolan. *Welding Journal*, v. 42, Nov. 1953, p. 529s-537s.

Reports investigation to determine relative abilities of carbon and low-alloy steels to resist cylic loading with and without stress raisers imposed by design and fabrication. Graphs, photographs, diagrams, tables. 6 ref.

2399 Transition Temperatures of Structural Steel Beams with Butt-Welded Splices. William J. Krefeld and George B. Anderson. *Welding Journal*, v. 32, Nov. 1953, p. 538s-576s.

Reports an investigation of resistance of butt-welded and unwelded structural beams to impact loads at low winter temperatures. Includes relative behavior of semikilled and fully killed steels, and low-hydrogen versus ordinary electrodes. Graphs, tables, diagrams, photographs. 3 ref.

2400* The Aging of Permanent Magnets. (German.) Klaus J. Kronenberg. *Zeitschrift für angewandte Physik*, v. 5, no. 9, Sept. 1953, p. 321-329.

Ballistic precision measurements were made to study effects of a variety of conditions on pseudo-remanence of different alloyed permanent magnet steels. Graphs. 17 ref.

See also:

2246 (properties of Ti and stainless steels at elevated temperatures)
2251 (Gd-Mg alloys, properties of)
2443 (effects of H_2 on deformation of steel)
2738 (properties of steel bolts)

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2401* Roll Size Effects in Cold Rolling of Metal Sheets and Strips. (German.) A. Geleji. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 1-2, 1953, p. 217-223.

Discusses lessening resistance to rolling encountered with smaller diameter work rolls. Flattening of rolls can be calculated with help of the formula of resistance to working and of the Herz formula of flattening of rolls pressed against each other. Diagrams. 5 ref.

2402 Infrared Determination of Total Aromatics in Naphthas and Catalytic Reformates Boiling Between 200 and 400 F. Joseph Bomstein. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1770-1772.

Includes tables. 10 ref.

2403* Symposium on Heavy Presses for Light-Metal Forgings and Extrusions. *ASME, Transactions*, v. 75, Nov. 1953, p. 1481-1533; disc., p. 1534-1542.

Includes "Introduction", J. C. Ward, Jr.; "Requirements for Large Light-Metal Forgings and Extrusions in the Aircraft Industry", C. W. Papen; "Design and Construction of Large Forging and Extrusion Presses for Light Metals", M. D. Stone; "Metallurgy and Production of Suitable Aluminum-Alloy Ingots for Large Forgings and Extrusions", T. L. Fritzlen; "Large-Forging-Press Operations and Production Problems", G. W. Motherwell, J. R. Douslin, and A. L. Rustay; and "Large-Extrusion-Press Operations and Production Problems", T. F. McCormick.

2404 Maximum Production on Hot Strip Mill. John E. Angle. *Blast Furnace and Steel Plant*, v. 41, Nov. 1953, p. 1289-1294, 1311.

Describes construction of mill, organization of personnel, and scheduling of operations.

2405 Rolls and Rolling. XXXVII. Tie Plates. *Blast Furnace and Steel Plant*, v. 41, Nov. 1953, p. 1313-1321.

Gives detailed instructions for rolling various types of rail tie plates.

2406* 60-Cycle Induction Heating. *Factory Management and Maintenance*, v. 111, Nov. 1953, p. 111-113.

Describes applications and presents advantages and limitations in heat treating and forging operations on Al.

2407* Determining Approximate Forces and Work During Free Forging. (Polish.) Jerzy Czarny. *Hutnik*, v. 20, no. 10, Oct. 1953, p. 212-216.

Presents calculations for determining work of forge hammers. Diagrams, graphs. 7 ref.

2408 Five-Step Cold Extrusion Line Forms 60-mm Mortar Shells. Ernest Olsen. *Iron Age*, v. 172, Nov. 19, 1953, p. 147-150.

Five cold extrusion presses form a complete line for forming shells without aid of other processing methods. Photographs. 4 ref.

2409 Extruding Fastener Holes Simplifies Sheetmetal Assembly. Federico Strasser. *Iron Age*, v. 172, Nov. 19, 1953, p. 151-153.

Describes extrusion of bosses on sheet stock. Discusses advantages of bosses over flat fastner holes. Diagram.

2410 How Machinable Are the Cast Irons? E. A. Loria. *Iron Age*, v. 172, Nov. 19, 1953, p. 158-161.

A guide to the election and machining of nodular, malleable, and gray cast irons. Table.

2411 Fabricators Install Extrusion Presses for Quick Service. W. G. Patton. *Iron Age*, v. 172, Nov. 5, 1953, p. 165-167.

Describes equipment and processes resulting in lower material costs and better quality control. Photographs, diagram.

2412 Cold "Rocking" Answers Design, Production Problems. K. W. Donle. *Iron Age*, v. 172, Nov. 5, 1953, p. 172-175.

Presents advantages of cold forging process including wide applications, improved mechanical properties, close dimensional control, superior surface finish, and reduction in material requirements. Diagrams, photographs, table.

2413 Roll-Design Research as Applied to Rolling-Mill Development. Bernard Robinson and W. A. Lugar. *Iron and Steel Institute, Journal*, v. 175, Oct. 1953, p. 183-197.

Deals with numerous points of roll design that should be studied and resolved before schemes for new rolling mills are developed. Tables, diagrams, graphs. 6 ref.

2414 Plastic Dies Speed Delivery of Experimental Stampings. W. Curtis Miller and W. J. Esdale. *Machinery*, v. 60, Nov. 1953, p. 172-177.

Describes preparation of dies for production of automobile bodies. Discusses materials, molds, patterns, and fitting. Photographs, diagram.

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2415 Piston Production at Ford Features Automation and Quality Control. Edgar Altholz. *Machinery,* v. 60, Nov. 1953, p. 196-201.

Describes machining, tin-plating, and grading. Photographs.

2416 Feeding Short Strip Stock to be Formed, Extruded, and Embossed Through a Progressive Die. Paul Prikos. *Machine and Tool Blue Book,* v. 49, Nov. 1953, p. 157-160.

Discusses incorporation of certain designs in the die to obtain smooth operation. Describes dies having automatic coil feed stock arrangements. Diagrams.

2417 Which Grade of Carbide Should You Use? Guy Monacelli. *Machine and Tool Blue Book,* v. 49, Nov. 1953, p. 162-166, 168, 170.

Describes various available Carboloy grades and their advantages and applications as cutting tools. Photographs, tables.

2418 Die Materials for Limited Production Runs. John L. Everhart. *Materials & Methods,* v. 38, Nov. 1953, p. 92-95.

Discusses properties, characteristics, and applications of dies made from zinc-base alloys, antimonial lead, bismuth-base alloys, hardwood (maple), densified wood, reconstituted wood, and cast phenolic plastics. Table, photographs.

2419 Machining Integrally Stiffened Structures. J. C. Borger. *Mechanical Engineering,* v. 75, Nov. 1953, p. 871-874.

Describes problems encountered in process but also presents tremendous advantages of its use, especially as applied to aircraft industry. Diagrams, photographs.

2420 Planetary Hot Rolling Mill. *Metal Industry,* v. 83, Oct. 1953, p. 339.

Describes mill, essential feature of which is that work rolls are of small diameter arranged in a planetary system around the circumference of the back-up rolls. Photograph.

2421 Rubber Pad Forming. *Modern Industrial Press,* v. 15, Nov. 1953, p. 22, 26, 28, 32, 34, 38.

Describes presses and tooling. Photographs.

2422* Superfinishing Methods for Rotating Shafts. F. Spicer. *Product Finishing,* v. 6, Oct. 1953, p. 48-51.

Discusses principle and advantages of superfinishing.

2423 How to Make Plastic Draw Dies in 9 Steps. G. C. Adams. *SAE Journal,* v. 61, Nov. 1953, p. 21-25.

Presents detailed description of making dies and tooling for production of automobile bodies. Diagrams.

2424 The Forming of Aluminium Sheet. II. Bending. H. Hinxman. *Sheet Metal Industries,* v. 30, no. 318, Nov. 1953, p. 943-948, 952.

Describes tooling and procedures for folding, flanging, curling, grooving, beading, and seaming. (To be continued.)

2425 Stretcher-Strain Markings in Aluminium Alloys and Methods for Their Elimination. V. A. Phillips. *Sheet Metal Industries,* v. 30, no. 319, Nov. 1953, p. 977-985.

Discusses effects of composition, grain size, heat treatment, and working. Graphs, tables. (To be continued.)

2426 The Rolling of Metals and Alloys. I. Historical Development of the Rolling Mill. Eustace C. Larke. *Sheet Metal Industries,* v. 30, no. 319, Nov. 1953, p. 989-998.

Describes types and uses of mills dating back to the 19th century. Diagrams, photographs. 10 ref. (To be continued.)

2427* Measurements and Controls in Modern Cold-Strip Mills. (German.) Joseph Billigmann. *Stahl und Eisen,* v. 73, no. 22, Oct. 22, 1953, p. 1394-1404.

Discusses present status and importance of measuring and controlling rolling speeds, pressures, and thicknesses of strips for increaed efficiency. Graph, tables, diagrams. 47 ref.

2428* Energy Consumption in Cold Forging on a Double-Thrust Press. (German.) Rudolf Kellermann and Kurt Alsen. *Stahl und Eisen,* v. 73, no. 22, Oct. 22, 1953, p. 1410-1418.

A calorimetric method for measuring pressures of high-speed forging processes is described. Method is not suitable for measuring pressures required to forge complex shapes. Graphs, photographs, table, diagrams.

2429* Determining Rolling Pressure and Energy With Nomograms. (German.) Werner Lueg. *Stahl und Eisen,* v. 73, no. 22, Oct. 22, 1953, p. 1426-1428.

Nomograms are presented and their use explained. Graphs, table.

2430 Super-Thin Strip. Rolling It Is Only Half the Job. *Steel,* v. 133, Nov. 16, 1953, p. 132-133.

Describes operation of a modern mill, including electric drives, air conditioning, hydraulic, electronic gaging, and precision grinding. Photographs.

2431 Bigger Slabs Answer Strip Demands. *Steel,* v. 133, Nov. 23, 1953, p. 92, 94.

Describes 45 x 90-inch universal slabbing mill accommodating ingots up to 20 tons in weight. Photographs.

2432* Large Pressure Vessel Forgings. A. A. Munro. *Times Review of Industry,* v. 7, new ser., Nov. 1953, p. 28-30, 33.

Describes composition and properties of the steels used and details of the forging operation. Photographs, tables.

2433 Electro-Spark Erosion for Metal Machining and Cutting. D. W. Rudorff. *Welding and Metal Fabrication,* v. 21, Nov. 1953, p. 425-429.

Describes basic principles underlying new method. Discusses its advantages. Reports most important applications lie in field of cemented carbides and highly alloyed heat-resistant alloys. Diagrams, photographs. 3 ref.

2434* Pre-Spinning Increases Drop Hammer Production. *Western Machinery and Steel World,* v. 44, Nov. 1953, p. 105-108.

Adapting spinning, as a pre-forming tool, in stage drop hammer operations has reduced costs and increased production. Photographs.

2435* Fine Tungsten and Molybdenum Wire for Electron Tubes. II. Its Application and Manufacture. C. C. Gee. *Wire Industry,* v. 20, Nov. 1953, p. 1075, 1077-1078, 1080, 1083.

Presents details of manufacturing and testing procedures involved in mass-production of wire. Diagrams, photographs.

2436* Stainless Steel Wiredrawing Through Diamond Dies. W. F. G. Kerley. *Wire Industry,* v. 20, Nov. 1953, p. 1095-1096, 1099-1100, 1103, 1106, 1113.

Describes problems and techniques of the process. Presents general discussion of diamonds; their origin, physical properties, and crystallography. Describes die mounting, repolishing, and lubricating. Photographs, diagrams, graph, table.

2437* The Kinetics of Grinding Processes. (German.) Gustav F. Hüttig. *Zeitschrift für Elektrochemie,* v. 57, no. 7, 1953, p. 534-539; disc., p. 539.

Describes grinding functions and their applications on coarse and fine grinding processes. Presents the problem of similarity between physical and chemical processes. Graphs, tables. 6 ref.

See also:
2212 (automatic stamping of auto parts)
2221 (suitable drives for cold-rolling spools)
2277 (rolling and drawing copper)
2293 (rolling of continuous cast Al)

METALS—METALLOGRAPHY, TRANSFORMATIONS, AND STRUCTURES

2438 Why Alternator Systems? Albert D. Gilchrist. *Automotive Industries,* v. 109, Nov. 1, 1953, p. 64-65, 118.

Presents an abstract of paper presented at SAE International West Coast Meeting in Aug. at Vancouver, B. C., Canada. Compares cost and performance of 14 v. 50 amp. d.c. truck generator against a 14 v. 60 amp. rectified a.c. system. Photographs, diagram, tables, graphs.

2439* Local Distortions of the Crystalline Lattice During Phase Hardening. (Russian.) L. Moroz and T. Mingin. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 249-251.

Concludes that a considerably smaller quantity of atoms which were not coherent were formed as a result of static distortions of the lattice than in the case of plastic deformation. Tables. 9 ref.

2440* Influence of Pressure on the Eutetoid Dissociation in Copper-Aluminum Alloy. (Russian.) M. I. Zakharova. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 287-289.

Copper alloy containing 12.5% Al prepared from electrolytic metals were used. Application of pressure in the quenching process after annealing increases the temperature of the start and completion of eutectoid dissociation. 4 ref.

2441* Calculation of the Intensity of Diffuse X-Ray Dispersion of Various Degrees of Order in the Position of Defects in Crystals. (Russian.) Iu. A. Bagariatskii. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1157-1160.

Considers problems of diffuse X-ray dispersion on a one dimensional case when position of defects in crystal are irregular. Graphs.

2442* Effect of Cobalt on Carbon Diffusion in Iron-Carbon Alloys. (Russian.) V. A. Iurkov and M. A. Krishtal. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1171-1173.

Describes experimental results of diffusion process in cast iron alloyed with Co. Graphs. 6 ref.

2443* Hydrogen in Pig Iron and Steel. (French.) Paul Bastien. *Fonderie*, 1953, Sept., no. 92, p. 3579-3598.

Discusses solubility of hydrogen in liquid iron and phenomena accompanying solidification. Describes analytical methods of determining hydrogen in steels and results obtained. Effect of hydrogen on pig iron crystallization, formation of air holes, graphitization, and plastic deformation is presented. Tables, graphs, diagrams, photographs. 55 ref.

2444* Investigation of Nonmetallic Inclusions in Steel. (Czechoslovakian.) Miroslav Sicha. *Hutnické Listy*, v. 8, no. 10, Oct. 1953, p. 506-512.

Samples were prepared and inclusions examined by chemical analysis, X-ray diffraction, and metallographic techniques. Diagrams, graphs. (To be continued.)

2445 Constitution of the Copper-Rich Copper-Aluminium-Germanium Alloys. G. V. Raynor and P. Greenfield. *Institute of Metals, Journal*, v. 82, Oct. 1953, p. 59-64.

Reports examination of above by metallographic and X-ray methods at 700, 600, and 550 C. Diagrams, tables. 6 ref.

2446 The Copper-Indium Eutectoid at 31.36 Wt.-% Indium. Chester W. Spencer and David J. Mack. *Institute of Metals, Journal*, v. 82, Oct. 1953, p. 81-85 + plates XIV-XV.

Discusses experimental work undertaken to determine structure. Graphs. 8 ref.

2447 The Free-Energy Diagram of the System Titanium-Oxygen. O. Kubaschewski and W. A. Dench. *Institute of Metals, Journal*, v. 82, Oct. 1953, p. 87-91.

Discusses experimental procedure to obtain data in order to construct free energy concentration curves of Ti-O System. Tables, diagram. 15 ref.

2448 Solidification of Steel. II. Structure, Segregation, and Non-Metallic Inclusions. T. B. King. *Iron & Steel*, v. 26, Nov. 1953, p. 513-520.

Reviews cast structure; theory and factors affecting segregation; and types, size, distribution, and effects of inclusions. 95 ref.

2449 A Study of the Propagation Mode for Metallic Vapors in Shadow-Casting by Vacuum Evaporation of Au^{198} and Cr^{51}. L. E. Preuss. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1401-1409.

Special method introduced for quantitatively determining metal-evaporation mechanism using metallic Au and Cr, tagged with pile-produced Au^{198} and Cr^{51}. Graphs, tables, photographs.

2450 The Habit Plane of Beta in Alpha Titanium. Paul A. Albert. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1449-1450.

Describes experimental procedure to determine the above. Presents a method of analysis. Photographs, diagram. 4 ref.

2451 The Silver-Cadmium Beta and Zeta Phases. L. Muldawer, M. Amsterdam, and F. Rothwarf. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, 1458-1459.

X-ray diffraction studies were made on β-prime region of the system. Table, graph. 8 ref.

2452 Neptunium-Aluminum Intermetallic Compounds. O. J. C. Runnalls. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1460-1462.

X-ray diffraction methods were used to study the above. Tables, diagrams, photographs. 7 ref.

2453 Diffusion and Solubility of Boron in Iron and Steel. Paul E. Busby, Mary E. Warga, and Cyril Wells. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1463-1468.

Reports diffusion rate of boron about same as carbon in austenite. Solubility at normal heat-treating temperatures is less than 0.001%. Tables, graphs, diagrams. 22 ref.

2454 Formation of Sigma Phase in the Mn-Mo System. B. F. Decker, R. M. Waterstrat, and J. S. Kasper. *Journal of Metals*, v. 5, *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1476.

Describes two methods of preparation. Tables. 3 ref.

2455 Titanium-Rich Regions of the Ti-C-N, Ti-C-O, and Ti-N-O Phase Diagrams. L. Stone and H. Margolin. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1498-1502.

Presents studies in the above. Diagrams, photographs, table. 10 ref.

2456 On the Theory of the Formation of Martensite. M. S. Wechsler, D. S. Lieberman, and T. A. Read. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1503-1515.

A theoretical analysis of austenite-martensite transformation is presented which predicts habit plane, orientation relationships, and macroscopic distortions from a knowledge only of crystal structures of initial and final phases. Diagrams, tables. 21 ref.

2457 Diffusionless Phase Change in the Indium-Thallium System. M. W. Burkhart and T. A. Read. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1516-1524.

Crystal geometry of cubic-tetragonal interface after partial transformation of an In-Tl alloy single crystal is described. A general theory is presented. Effects of applied stress are interpreted. Diagrams, photographs, graphs. 15 ref.

2458 Effects of Sample Surface and X-Ray Diffraction Camera Geometry on the Determination of Retained Austenite in Hardened Steels. Karl E. Beu and Donald P. Koistinen. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1529-1530.

Describes experiments to determine effect of irregular surfaces on reliability of austenite determinations. Diagram, table. 7 ref.

2459 Calculation of Interdiffusion Coefficients When Volume Changes Occur. Morris Cohen, Carl Wagner, and J. E. Reynolds. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1534-1436.

Suggests modifications necessary in order for diffusion equation to retain its usual form. 9 ref.

Metals—Metallography, Transformations, and Structures

2460 The Molybdenum-Boron System. Paul W. Gilles and Bernard D. Pollock. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1537-1539.

Discusses studies in phase diagram at high temperatures. Diagram, table. 3 ref.

2461 Notes on the Determination of Retained Austenite by X-Ray Methods. Karl E. Beu. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1539-1540.

Discusses factors affecting reliability of the determination. Diagram. 4 ref.

2462 The Partition of Some Alloying Elements Between Carbide and Ferrite in Steels. D. A. Scott and G. S. Farnham. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1541-1543.

Presents studies in the above. Reports partition of one element is not much affected by presence of another. Tables. 7 ref.

2463 System Titanium-Chromium-Molybdenum. R. P. Elliott, B. W. Levinger, and W. Rostoker. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1544-1549.

Presents studies in phase equilibria of the above. Table, diagrams, graphs. 12 ref.

2464 Metallographic Structures in Commercial Titanium. Roman Osadchuk, William P. Koster, and John F. Kahles. *Metal Progress*, v. 64, Nov. 1953, p. 93-96.

Discusses etching, heat tinting, and phase identification. Micrographs.

2465 Metallography of Highly Radioactive Materials. M. J. Feldman. *Metal Progress*, v. 64, Nov. 1953, p. 97-102.

Describes equipment and procedures for specimen preparation and examination. Photographs, micrographs.

2466 Production of Oriented Single-Crystal Silicon Iron Sheet. C. G. Dunn and G. C. Nonken. *Metal Progress*, v. 64, Dec. 1953, p. 71-75.

Equipment and techniques are described in detail. Photographs, diagrams.

2467 The Growth of Metal Grains. (French.) Paul Lacombe. *Metaux, Corrosion-Industries*, v. 28, no. 338, Oct. 1953, p. 377-391.

Presents literature review. Attempts to clarify the conceptions and confusion in terminology especially with respect to primary recrystallization and continued and discountinued growth. Micrographs. 35 ref.

2468* Comparison of Radiographic and Magnetic Methods of Determining Internal Stresses of Nickel. (German.) Eugen Kappler and Ludwig Reimer. *Naturwissenschaften*, v. 40, no. 20, 1953, p. 523-524.

Presents a literature review. 7 ref.

2469* Formation of Metallic Properties in Ionic and Valence Lattices. (German.) H. Krebs. *Naturwissenschaften*, v. 40, no. 20, 1953, p. 525-526.

Presents examples to show that width of forbidden zone in crystals decreases with increasing resonance between *p*-electrons to form metallic conductors. Diagrams. 9 ref.

2470 Electron Microscopic Observation of 111 Faces of ZnS Crystals. W. Dekeyser, S. Amelinckx, E. Votava, and G. Vandermeerssche. *Philosophical Magazine*, v. 44, 7th ser., no. 357, Oct. 1953, p. 1142-1144.

Describes growth fronts and slip lines. 6 ref.

2471 Metallic Carbides and Nitrides of the Type MX. William Hume-Rothery. *Philosophical Magazine*, v. 44, 7th ser., no. 357, Oct. 1953, p. 1154-1160.

Reports that the face-centered cubic arrangement with metal atoms is favored mainly because it provides metallic atoms with mutually perpendicular bonds to six neighbors. Tables. 10 ref.

2472* Electron Microscopic Observations of the Effect of Recrystallization on the Substructure of Copper. (French.) Laurence Delisle. *Revue de metallurgie*, v. 50, no. 10, Oct. 1953, p. 665-682.

Discusses relationship between substructures and mechanical and thermal treatment of the metal. Experimental details are indicated. Tables, micrographs. 22 ref.

2473 On the Reduction Equilibrium Diagram of Iron Oxide. (English.) Koji Sanbongi. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 1, Feb. 1953, p. 53-62.

The author corrected his previous reduction equilibrium diagram for the Fe-C-O system. Data for the Fe-H-O system were calculated. Diagrams, tables. 10 ref.

2474 Light Figures of Bismuth Single Crystals and the Determination of Their Crystal Orientations by the Light-Figure Method. II. Light Figures. III. Orientation Determination by Light Figures. (English.) Mikio Yamamoto and Jiro Watanabé. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 2, Apr. 1953, p. 124-146.

Light figures produced by etching with various reagents were observed and crystal orientations were determined. Diagrams, photographs, tables. 4 ref.

2475 Electron Diffraction Study on the Selective Oxidation of Copper-Aluminium Alloys. (English.) Denjiro Watanabe, Shiro Ogawa, and Takashi Kimura. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 3, June 1953, p. 238-253.

Oxide films on alloys containing 1 to 10% Al were examined. Attempts were made to correlate nature of films, treatment temperature, and discoloration resistance to various acids. Tables, graphs, diagrams.

2476 How to Tell a Good High Speed Tool When you See One in a Microscope. Michael J. Antus and Birger L. Johnson. Steel, v. 133, Nov. 23, 1953, p. 88-89.

Presents micrographs showing distribution of carbides, heat treated structure, surface condition, and austenitic grain size.

2477 Standard X-Ray Diffraction Powder Patterns. v. I. Data for 54 Inorganic Substances. Howard E. Swanson and Eleanor Tatge. *U. S. National Bureau of Standards Circular* 539, June 15, 1953, 95 p.

Sets of patterns in the National Bureau of Standards file for 16 pure metals and 38 inorganic substances have been reviewed with the object of supplanting them with single standard patterns. Tables. 264 ref.

See also:
2264 (activity of C in liquid Fe)
2360 (effects of Na on structure of light alloys)
2502 (lattice constants of TiN)

METALS—POWDER

2478. Metal-Ceramic Interactions. I. Factors Affecting Fabrication and Properties of Cermet Bodies. W. D. Kingery. *American Ceramic Society, Journal*, v. 36, Nov. 1953, p. 362-365.

Includes metal-ceramic reactions, surface and interfacial energies, constituent properties, and effect of dispersed state on properties. 22 ref.

2479* Electrodeposition of Copper Powder. H. J. Modi and G. S. Tendolkar. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Sept. 1953, p. 431-438.

Investigates electrodeposition of copper powder from an acid copper sulphate bath and the effects of adding glucose, glycerine, glue, gelatin, and sodium naphthalene β-sulphonate. Tables, micrographs. 13 ref.

2480* Kinetics of Grinding Processes. (German.) O. Theimer. *Kolloid-Zeitschrift*, v. 133, no. 1, Oct. 1953, p. 44-50.

Kinetic theory of powder grinding is extended to higher-order reactions. A procedure to find approximate values of grinding functions is established. Influence of the approximations on numercial values is investigated. Graphs.

2481 Super Refractories for Use in Jet Engines. Walther L. Havekotte. *Metal Progress*, v. 64, Dec. 1953, p. 67-70.

Describes manufacture, structure, mechanical properties, and high temperature oxidation resistance of various TiC cermets. Graphs, photographs, tables.

2482* Sintered Contact Materials. IV. Laboratory Method for Obtaining Electric Contact Materials by Hot Pressing. (Polish.) S. Stolarz. *Prace Instytutow Ministerstwa Hutnictwa*, v. 5, no. 3, 1953, p. 135-142.

Discusses chemical composition of contacts, sintering current intensity, and time and pressing pressures. Diagrams, tables, graphs, micrographs. 7 ref.

2483* Tailor-Made Metals and Their Properties. K. R. Beardslee. *Precision Metal Molding*, v. 11, ov. 1953, p. 34-36, 76.

Discusses techniques of processing, properties, and applications of cemented carbides. Photographs, table.

2484* The Sintering Process. II. Furnaces. Philip R. Kalischer. *Precision Metal Molding*, v. 11, Nov. 1953, p. 44-46, 76-80.

Discusses design and use of sintering furnace and importance of time and temperature to the process. Graph, diagrams, table, photographs.

2485* The Metal Powder Industry. Robert L. Ziegfeld. *Precision Metal Molding*, v. 11, Nov. 1953, p. 50-52, 93.

Excerpts from paper delivered before American Society of Tool Engineers, Sept. 14, 1953. Discusses growth of the industry and its applications.

2486 On the Mechanical Disintegration of Metal by a Stamp Mill. (English.) Tosihiko Okamura, Koji Inagaki and Yoshimichi Masuda. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 1, Feb. 1953, p. 71-80.

Metal powders were prepared. Particle sizes and distributions were determined. Graphs, diagrams, micrographs.

See also:
1531 (TiC cermet)

MINING ENGINEERING

2487* Artificial Formation Fracturing in Southern Oklahoma and North-Central Texas. Warren L. Sallee and Fred E. Rugg. *American Association of Petroleum Geologists, Bulletin*, v. 37, Nov. 1953, p. 2539-2550.

Discusses artificial fracturing of formations to improve oil production. Map, diagrams. 4 ref.

2488* Diamond Core Drilling. G. Anthony Robinson. *Mine & Quarry Engineering*, v. 19, Nov. 1953, p. 416-420.

Hazards and limitations of core-drill prospecting are examined. General matters connected with diamond-drilling practice are discussed. Photographs, tables, diagrams. (To be continued.)

2489 Faster Drilling Awaits Upping of Energy at Hole Bottom. John V. Pennington. *Oil and Gas Journal*, v. 52, Nov. 16, 1953, p. 245-246, 250, 252, 254.

Describes research on percussive devices for drilling. Graphs.

2490 Martensite Bad Medicine for Drilling Lines. C. M. Zerr. *Oil and Gas Journal*, v. 52, Nov. 30, 1953, p. 79-80, 82, 84.

Reports that not all wickering is a result of martensite. Other correctable factors may be responsible. Photographs.

2491 Factors Affecting Perforated Completions. Robert E. Bush. *Petroleum Engineer*, v. 25, Nov. 1953, p. B59-B63, B66.

Discusses requirements and factors contributing to their effectiveness. Graphs, photographs. 5 ref.

2492* The Intensive Analysis of Oil Field Cores. J. C. Calhoun, F. W. Preston, and C. R. Killins. *Producers Monthly*, v. 17, Apr. 1953, p. 64-71.

Discusses intensification of core analysis, correlation of routine tests, and handling of cores. Tables, graphs. 3 ref.

See also:
2038 (uranium mining operations)
2285 (Co mines of Africa)

NONDESTRUCTIVE TESTING

2493* Novel X-Ray Diffraction Technique for Measuring Internal Stresses in Metals. (German.) I. Szántó. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 1-2, 1953, p. 165-186.

A new method of testing steel has made attainable a degree of precision identical with current radiographic techniques, but by a much simpler measuring procedure. Tables, graph, photographs, diagrams. 15 ref.

2494* Testing Complexly Shaped Parts With Ultrasound. (German.) Erich Martin and Karl Werner. *Archiv für das Eisenhüttenwesen*, v. 24, nos. 9-10, Sept.-Oct., 1953, p. 411-422.

Numerous examples are presented to show that the oblique application of the impulse-echo process is especially suitable for detecting defects. Photographs, diagrams.

2495* Sheet-Metal Thickness Measuring Instruments, Especially for Measuring Thicknesses of Rolled Strip. I. Induction and X-Ray Measuring Instruments. (German.) N. de Ball. *Archiv für technisches Messen*, 1953, no. 213, Oct., p. 219-222.

Includes diagrams, photographs.

2496* Materials Testing With Gamma and Beta Rays. IV. Technique of Recording; Detectability of Details; Transillumination. (German.) E. A. W. Müller. *Archiv für technisches Messen*, 1953, no. 213, Oct., p. 233-236.

Discusses proper techniques for flaw testing. Compares accuracy of various methods. Discusses trans-illumination with radioactive substances. Tables, diagrams. 25 ref.

2497* Betatron and Isotope Radiography. A. von Arx. *Brown Boveri Review*, v. 40, no. 8, Aug. 1953, p. 289-295.

Describes the limits of application of radioisotopes, X-ray apparatus, and betatrons and their respective advantages and disadvantages. Radiographs, photographs, diagrams. 4 ref.

2498* Non-Destructive Testing of Brown Boveri Products by Gamma-Radiography. A. Lüthy. *Brown Boveri Review*, v. 40, no. 8, Aug. 1953, p. 296-304.

Describes determination and location of internal faults in cast and welded machine parts. Radiographs, photographs.

2499* An Electronic Thickness Gage. Abner Brenner and Jean Garcia-Rivera. *Plating*, v. 40, Nov. 1953, p. 1238-1243; disc., p. 1244.

Discusses design, operation, and applications of instrument for measuring thickness of coatings on metals provided the conductivities of coating and basis metal differ sufficiently. Graphs, diagrams, photographs. 6 ref.

2500* Optical Gaging of Cams Saves Time and Money. E. C. Polidor. *Screw Machine Engineering*, v. 15, Nov. 1953, p. 64-65.

Rapid, precise inspection of the entire contour is effected quickly and easily. Photographs, diagram.

2501 Gaging With Activated Neutrons. H. V. Watts and L. Reiffel. *Steel*, v. 133, Nov. 23, 1953, p. 110-111.

Describes β-ray gaging of Ag plating on radar waveguides. Photographs.

2502* X-Ray Studies of Titanium Nitride and Titanium Carbide Surface Coatings. (German.) A. Münster and K. Sagel. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, p. 571-579.

Reports determination of lattice constants. Describes X-ray methods of measuring film thickness and phenomena of oriented

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crystal growth in titanium nitride films. Tables, graphs, micrographs. 22 ref.

See also:
1581 (generation of ultrasonics)
2468 (radiographic and magnetic testing)
2671 (ultrasonic testing of rubber)

NUCLEAR PHYSICS, NUCLEONICS, AND RADIATION

2503* The Scattering of 1 MeV Electrons and Positrons. J. A. McDonell. *Australian Journal of Physics*, v. 6, Sept. 1953, p. 245-261.

Demonstrates that the ratio of the fraction of electrons scattered through an angle theta to the fraction of positrons scattered through theta varies with theta, and the magnitudes of the ratios agree with those predicted by theory. 24 ref.

2504 Power From Nuclear Fission. Harold C. Urey. *Chemical and Engineering News*, v. 31, Nov. 9, 1953, p. 4660-4663.

Private enterprise is encouraged to take part in development; states that government should decrease control. Diagrams.

2505 Nuclear Physics and Metals. L. G. Cook. *Chemistry in Canada*, v. 5, Nov. 1953, p. 236-238.

Outlines special requirements of the nuclear chemist for metals and how they may be met. Discusses also problems involved with handling of uranium, plutonium, and other rare earth metals. Tables, graphs.

2506* Determining Masses of Cosmic Ray Particles by Their Ionizing Capacity. (Russian.) A. I. Alikhanian and V. M. Kharitonov. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1125-1128.

Uses previous data of ionizing capacity of particles of various groups with mass between meson and proton for a more accurate determination of their masses. Tables, graphs. 4 ref.

2507 Atomic Power in Ohio. Philip Sporn. *Electrial Engineering*, v. 72, Dec. 1953, p. 1047-1051.

Presents general discussion regarding Ohio's past role in the atomic development program. Suggests possible peacetime projects for study of nuclear energy as source of power. Photographs.

2508* Reconstruction of the NRX Reactor at Chalk River. J. L. Gray. *Engineering Journal*, v. 36, Oct. 1953, p. 1269-1277.

Canada's original reactor and the nature of its break-down is discussed. A detailed description is given of dismantlement of old reactor and reconstruction of improved and more powerful unit.

2509 The Chemical Effects of Radiative Thermal Neutron Capture. I. Permanganates. K. J. McCallum and A. G. Maddock. *Faraday Society, Transactions*, v. 49, Oct. 1953, p. 1150-1160.

Retention of radioactive Mn in form of permanganate ion was investigated in its dependence upon the pH of solution in which irradiated crystals were dissolved. Graphs, tables. 24 ref.

2510 The X- and γ-Ray Oxidation of Ferrous Sulphate in Aqueous Solution. H. A. Dewhurst. *Faraday Society, Transactions*, v. 49, Oct. 1953, p. 1174-1190.

Presents results of experimental investigation. Diagrams, tables, graphs. 28 ref.

2511 Laboratories for Handling Radioactive Materials. W. B. Harris. *Heating and Ventilating*, v. 50, Nov. 1953, p. 74-78.

Discusses special design requirements including separation of high and low level work, additional floor space and ventilation, adequate shielding, and proper waste disposal systems. Diagrams.

2512* Some Regularities in the Masses of Heavy Particles. Kantilal M. Gatha. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Aug. 1953, p. 194-198.

Includes table. 11 ref.

2513 Chemical Engineering Aspects of Nuclear Power. Manson Benedict. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2372-2380.

Discusses types and sources of nuclear fuels. Mentions modification of weapons plant for power generation. Photographs, graphs, tables, diagrams. 10 ref.

2514* Nuclear Reactors for Industry and Research. III. Radiation Measurement. Ernest H. Wakefield. *Instruments*, v. 26, Nov. 1953, p. 1702-1704, 1750, 1752, 1754, 1756, 1758.

Basic to all work on or near nuclear reactors is knowledge of the types of nuclear radiations and of the instruments, by which the radiations are detected and measured. Photographs, diagrams.

2515 Production of Radioisotopes. A. F. Rupp and F. T. Binford. *Isotopics (U. S. Atomic Energy Commission)*, v. 3, Oct. 1953, p. 9-27.

Reviews procedures at Oak Ridge National Laboratory. Graphs, diagrams. 4 ref.

2516* Hf^{175} and Hf^{181} Radiation. Short Summary of Information on the Radioactive Isotope Hf^{175} and Hf^{181}. (Russian.) A. A. Bashilov, H. M. Anton'eva, B. S. Dzhelepov, and A. I. Dolgintseva. *Izvestiia Akademii Nauk SSSR, Seriia Fizicheskaia*, v. 17, no. 4, July-Aug. 1953, p. 437-467.

Works and results of Soviet and foreign authors are discussed and criticized. Tables, graphs. 43 ref.

2517* Zn^{65} Radiation. I. Brief Summary of Information on the Radioactive Zn^{65} Isotope. (Russian.) A. A. Bashilov, N. M. Anton'eva, D. L. Broder, and B. S. Dzhelepov. *Izvestiia Akademii Nauk SSSR, Seriia Fizicheskaia*, v. 17, no. 4, July-Aug. 1953, p. 468-486.

Discusses stable isotopes and presents a table of radioactive isotopes and their half-life. Describes position spectrum of Zn^{65}, γ and β radiation, and conversion coefficients. Tables, graphs. 46 ref.

2518* Investigation of Tb^{160} Radiation. (Russian.) L. Ia. Shavtvalov. *Izvestiia Akademii Nauk SSSR, Seriia Fizicheskaia*, v. 17, no. 4, July-Aug. 1953, p. 503-506.

Longer life isomer of Tb^{160} was studied by rough absorption and magnetic spectrometer methods. Graphs, tables. 7 ref.

2519* β-Spectrum Re^{186}. (Russian.) N. M. Anton'eva, A. A. Bashilov, B. S. Dzhelepov, and L. S. Chervinskaia. *Izvestiia Akademii Nauk SSSR, Seriia Fizicheskaia*, v. 17, no. 4, July-Aug. 1953, p. 507-510.

Measurement of Re^{186} was begun seven days after bombardment. Half-life was shown to be 93 hr. No exact scheme of disintegration is given. Tables, graphs. 14 ref.

2520* γ Radiation of Cu^{64}. (Russian.) B. S. Dzelepov, N. N. Zhukovskii, V. P. Prikhodsteva, and Iu. V. Kholnov. *Izvestiia Akademii Nauk SSSR, Seriia Fizicheskaia*, v. 17, no. 4, July-Aug. 1953, p. 511-517.

Describes measurements and processing of results. Tables, graphs. 32 ref.

2521 The Photochemical Separation of Isotopes. Bruce H. Billings, W. J. Hitchcock, and Murray Zelikoff. *Journal of Chemical Physics*, v. 21, Oct. 1953, p. 1762-1766.

Describes method involving use of monoisotopic resonance lamp as source of light for photochemical reaction. Tables, diagrams, graphs. 16 ref.

2522 Diffusion Length of Thermal Neutrons in Water. James A. DeJuren and Hyman Rosenwasser. *Journal of Research, National Bureau of Standards*, v. 51, Oct. 1953, p. 203-207.

Presents method of determination by measuring variation of thermal-neutron density at large radii from the center of a photoneutron source. Graphs, tables. 10 ref.

2523 Gamma-Ray Dosimetry With Organic Scintillators. R. T. Carr and G. J. Hine. *Nucleonics*, v. 11, Nov. 1953, p. 53-55, 68.

Dosage measurements with anthracene crystals show that "air-equivalence" is attainable with organic scintillator for 0.2-3.0 m.e.v. γ-rays. Accuracy depends on scintillator thickness, sec-

ondary-electron equilibrium, and radiation scattering. Graphs. 5 ref.

2524* Gamma Rays Emitted From ^{60}Co, ^{56}Mn, ^{187}W, ^{128}I, ^{106}Rh. (English.) E. Germagnoli, A. Malvicini, and L. Zappa. *Nuovo cimento*, v. 10, ser. 9, no. 10, Oct. 1, 1953, p. 1388-1405.

Coincidence arrangement of two single-crystal spectrometers suitable for the analysis of decay schemes of radioisotopes was developed and used to study γ radiations. Diagrams, graphs. 38 ref.

2525* Chree Analysis of Pressure-Temperature-Corrected Cosmic-Ray Burst Frequencies. (English.) J. W. Broxon. *Nuovo cimento*, v. 10, ser. 9, no. 10, Oct. 1, 1953, p. 1434-1440.

Recurrences at intervals of 27 days have been found to persist after correction of burst data for variations in barometric pressure and atmospheric temperature. Graph. 11 ref.

2526* On the Possible Existence of Associated Knock-On Electrons. (English.) A. W. Wolfendale. *Nuovo cimento*, v. 10, ser. 9, no. 10, Oct. 1, 1953, p. 1493-1494.

Experiments show that it is unlikely that any degree of dependence exists in production of electron secondaries. Table. 4 ref.

2527 Nuclear Reactions Produced by the Bombardment of Boron by Low Energy Alpha-Particles. E. S. Shire, J. R. Wormald, G. Lindsay-Jones, A. Lundén, and A. G. Stanley. *Philosophical Magazine*, v. 44, 7th ser., no. 358, Nov. 1953, p. 1197-1212.

Discusses resonances, angular distribution of emitted particles, spins and parities, reaction cross sections, and level widths. Graphs, tables. 16 ref.

2528 The Elastic Scattering of Particles by Atomic Nuclei. N. C. Francis and K. M. Watson. *Physical Review*, v. 92, ser. 2, Oct. 1953, p. 291-303.

Discusses use of optical model to obtain an explicit expression in terms of scattering amplitudes. 24 ref.

2529 Free Nuclear Induction. E. L. Hahn. *Physics Today*, v. 6, Nov. 1953, p. 4-9.

Describes unusally clear measurements of time precession of nuclear magnetic moments, and other properties of nuclei which have become possible with development of free induction "spin echo" technique. Diagrams, photographs. 7 ref.

2530 Housing for Co^{60} Gamma-Ray Source for Experimental Work. R. F. Firestone and J. E. Willard. *Review of Scientific Instruments*, v. 24, Oct. 1953, p. 904-906.

Discusses design and use of relatively simple housing unit and describes transfer to it of source-capsule from shipping container. Diagram, photograph. 6 ref.

2531 Extrapolation Chamber for the Measurement of Beta Sources. Robert Loevinger. *Review of Scientific Instruments*, v. 24, Oct. 1953, p. 907-914.

Construction, operation, and application of a variable-spacing, parallel-plate ionization chamber is described. Photographs, diagram, graph. 7 ref.

See also:
1488 (toxicity of heavy water)
1508 (use of ^{32}P as indicator)
1643 (tracer techniques)
1678 (radioisotopes in chromatography)
1696 (radioisotopes in analytical chemistry)
1818 (corrosion tests of liquid coolants)
1943 (Van De Graaff generator)
2260 (radiographic study of sinters)
2575 (scintillation substances)
2610 (mathematical physics)

OPERATIONS RESEARCH AND MANAGEMENT ENGINEERING

2532* Prerequisites for Production. R. A. Neale. *Aircraft Production*, v. 15, Nov. 1953, p. 432-435.

Discusses subject under headings of plans, plant, policy, and people. Shows importance of satisfactory interaction among them. Charts, photographs.

2533* Management Targets for 1954. Eugene Whitmore. *American Business*, v. 23, Nov. 1953, p. 10-11, 26, 28.

Discusses customer satisfaction quality control, dealer service, better communications, expense control, personnel selection, employee attitude, complaint handling, and modernization of methods.

2534* The Parade of Papers. W. H. Conant. *American Business*, v. 23, Nov. 1953, p. 14-15, 36.

Stresses simplicity of procedure to reduce needless paper work. Photographs.

2535* Ten Ways to Save Personnel. Harry L. Wylie. *American Business*, v. 23, Nov. 1953, p. 20-21.

Discusses means of keeping personnel at a minimum while paper works increases. Photograph.

2536 Market Research Removes the Blindfold. George A. Morgan. *American Gas Association Monthly*, v. 35, Nov. 1953, p. 8-10.

Discusses how market research, even on a small scale can prove a valuable source of information for an entire industry.

2537 Underground Gas Storage Rights. Charles W. Studt. *American Gas Association Monthly*, v. 35, Nov. 1953, p. 31-33, 45.

Discusses rights which the gas storage operator should acquire and how they can be secured.

2538* Studies in Vanadium Toxicology. John T. Mountain, Laryl Lee Delker, and H. E. Stokinger. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Nov. 1953, p. 406-411.

Vanadium ingestion in rats resulted in depressed cystine content of the hair. Administration of methionine gave some indications of counter acting the unfavorable effects of vanadium. Tables.

2539* Pneumoconiosis in the Tungsten-Carbide Tool Industry. Charles W. Miller, Martin W. Davis, Alfred Goldman, and John P. Wyatt. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Nov. 1953, p. 453-465.

Three cases are reported concerning workers in the WC industry who have shown peculiar types of pulmonary reactions and hyperglobulinemia. Photographs, micrographs.

2540* Studies of the Acute and Chronic Toxicity of Germanium. George Rosenfeld and E. J. Wallace. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Nov. 1953, p. 466-479.

Data are presented on the physiological effects of Ge by various routes of administration. Tables, graphs.

2541 Cybernetics in Our Day. Our Second Industrial Revolution. The Age of the Automatics. E. B. Weiss. *Brick & Clay Record*, v. 123, Nov. 1953, p. 77-80, 90, 97, 101.

Presents general elementary exposition of new science and overall view of its significance to our economy. Diagrams, photographs.

2542 The Problems of the Man With Two Countries. *Business Week*, 1953, no. 1263, Nov. 14, p. 112-114.

Discusses the role and problems of foremen in industry.

2543 Research in Defence. J. C. Arnell. *Chemistry in Canada*, v. 5, Nov. 1953, p. 231-235.

Discusses versatile projects being carried out by Defense Research Chemical Laboratories of Canada. Photographs.

2544* Materials Handling in Large Gasworks. C. G. Harmer. *Coke and Gas*, v. 15, Oct. 1953, p. 353-360, 370.

Installation for the handling of coal, coke, and oxide at Nine Elms, Beckton, and Kensal Green works are described. Photographs, diagrams. 8 ref. (To be continued.)

2545* Materials Handling at Steelworks Coke Ovens. *Coke and Gas*, v. 15, Nov. 1953, p. 415-420.

Presents description of handling systems used in blending and in bringing together raw materials of iron making process. Photographs. 3 ref.

Operations Research and Management Engineering

2546* An Outline of the Skills of Management. Ralph M. Besse. *Edison Electric Institute Bulletin*, v. 21, Sept. 1953, p. 331-336.

Paper presented at Summer General Meeting of the AIEE, Atlantic City, N. J., June 16, 1953.

2547* The Engineer and Accountant Work Together on Solving a Technical Problem. E. Devere Cowles. *Edison Electric Institute Bulletin*, v. 21, Sept. 1953, p. 345-346.

Accountants and engineers consider together the possibilities of greater use of the tools of the accountant to assist the engineer in the solution of some of his technical problems.

2548* Statistical Quality Control in Small-Lot Heavy Manufacturing. Leo W. Bosch. *Factory Management and Maintenance*, v. 111, Nov. 1953, p. 98-99.

Discusses benefits of quality control charts and methods of installing the system. Charts.

2549* They're Chalking Up Safe Man-Hours by the Millions. Albert B. Ott. *Food Engineering*, v. 25, Nov. 1953, p. 84-85, 176.

An account of one company's successful drive to eliminate disability injuries.

2550 Materials Handling. T. W. Rodes. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 121A-123A.

Discusses advantages of pneumatic conveying.

2551* How to Maintain Interest in Work Simplification. Lillian Stemp. *Inland Printer*, v. 132, Nov. 1953, p. 33-36.

Sets forth methods used in several plants for maintaining strong enthusiasm to the "work simplification" approach. Photographs.

2552* Group Interest and Managerial Enterprise. Oswald W. Knauth. *Journal of Industrial Economics*, v. 1, no. 2, Apr. 1953, p. 88-98.

Discusses relation of stockholders to management and of management to employees, customers, and government. Describes incentives and restraints on management and essential character of market processes.

2553* Operational Research—A New Tool for Management. I. S. Lloyd. *Journal of Industrial Economics*, v. 1, no. 3, July 1953, p. 175-186.

Defines operation research and describes advantages when used as a supplement to industrial research.

2554* Safety in the Laboratory. Alec Webster. *Laboratory Practice*, v. 2, Nov. 1953, p. 601-604.

A general discussion.

2555 Work Study as a Means of Increasing Output. B. H. Dyson. *Machinery (London)*, v. 83, Oct. 30, 1953, p. 849-854.

Discusses determination of wage rates from time studies; applications of work measurement; product design for efficient production; and production planning and control. Graphs, tables.

2556* Handling Adaptations in a Press Shop. *Mechanical Handling*, v. 40, Nov. 1953, p. 526-527.

Describes increased efficiency through adaptations in materials handling equipment. Photographs.

2557* A New Method of Handling and Storing Small Components. L. J. Hoefkens. *Mechanical Handling*, v. 40, Nov. 1953, p. 535-542.

Describes new method and control systems associated with it. Photographs.

2558* Mechanical Handling in a Large Gasworks. J. M. Beskine. *Mechanical Handling*, v. 40, Nov. 1953, p. 543-548.

Describes equipment, plant layout, and operational procedures. Photographs, diagrams.

2559 Ten Practical Uses of Statistical Quality Control in Metallurgical Plants. *Metal Progress*, v. 64, Nov. 1953, p. 82-88.

Describes uses to obtain quality assurance, customer standards, operator interest, and tolerances for machines and methods. Gives examples of uses in production of articles from Al sheet. Photographs, diagrams, quality control form.

2560 Some Applications of Statistical Analysis in the Steel Industry. John W. W. Sullivan. *Metal Progress*, v. 64, Dec. 1953, p. 91-96, 97-98.

Discusses ways in which test and production data can be used to establish controls of product variability.

2561* The Long Term Outlook for the Metals. *Mining Journal*, v. 241, Nov. 13, 1953, p. 560-562.

Extracts from "Research as a Foundation for Mineral Progress", Clyde Williams and D. C. Minton, Jr. Discusses factors promoting increased production and consumption of minerals. Outlines ways research can help in meeting the increased demands. Graphs.

2562* Boeing Adopts New Manufacturing Research Set-up. E. K. Austin. *Modern Machine Shop*, v. 26, Nov. 1953, p. 150-153.

Describes new organizational setup which integrates research with production. Photographs.

2563 Discharging Iron Ore. R. T. Eddison and D. G. Owen. *Operational Research Quarterly*, v. 5, Sept. 1953, p. 39-50.

Reviews operation of importing iron ore, from overseas dock-side to home dock-side, in order to determine how to keep costs low as possible. Diagram, graphs.

2564* Methods of Reducing Sample Size in Monte Carlo Computations. H. Kahn and A. W. Marshall. *Operations Research Society of America, Journal*, v. 1, Nov. 1953, p. 263-278.

Deals with methods to reduce the sample size required to produce estimates of a fixed level of accuracy or to increase the accuracy of the estimates for a fixed cost of computation. 10 ref.

2565 How to Solve Materials Handling Problems in the Medium-Sized Paint Factory. II. J. M. Beskine. *Paint Manufacture*, v. 23, Nov. 1953, p. 359-362.

Discusses selection of equipment, handling procedures, and storage of finished goods. Photographs.

2566* Statistical Quality Control at Detroit's Ternstedt Division. Bryant W. Pocock. *Products Finishing*, v. 18, Nov. 1953, p. 24-32, 34, 36, 38, 40, 42.

Discusses adoption of quality control and procedure for putting it into practice for pinpointing operations causing defective Cu plated products. Photographs, graphs.

2567 The Systems Approach to Air Weapons Development. D. L. Putt. *SAE Preprint* no. 39, 1953, 7 p. (TL1 So3p)

Systems approach involves planning and programming; management and engineering to insure unit operation; and scheduling to insure proper timing.

2568* Statistical Quality Control in Waste Treatment. John M. Fairall. *Sewage and Industrial Wastes*, v. 25, Nov. 1953, p. 1282-1288.

Examples are given of control charts and plots of biological oxidation demand loading. Graphs, tables. 8 ref.

2569* Statistical Control. Some Methods Applicable to Welded Construction. (French.) G. d'Herbemont. *Soudure et Techniques connexes*, v. 7, no. 9-10, Sept.-Oct. 1953, p. 242-250.

Describes three groups of methods for determining causes of quality variation. Proposes plan and analysis of variance capable of serving as a basis for tests on quality of weldments. Tables, graphs.

2570* Mechanical Accounting in the Textile Industry. A. W. Mattocks. *Textile Institute, Journal, Proceedings and Standarization*, v. 44, Oct. 1953, p. P722-P726.

Describes use of punched cards as medium for account recording.

2571* Compiling, Planning According to Dates, and Control of Over-All Job-Planning Measures. (Hungarian.) István Kálmán. *Többtermelés*, v. 7, no. 10, Oct. 1953, p. 14-18.

Describes the purpose of above measures as assuring the uninterrupted industrial development of plants. The "over-all job-planning measure" is to be considered as the master plan comprising and controlling the execution of all partial plans. Individual measures leading to the above are discussed in detail. Outlines of sample plans are given.

2572* Is Your Foreman on the Management Team? Miles Robson. *Wood and Wood Products*, v. 58, Nov. 1953, p. 27-28, 30-31.

Discusses the status of the foreman in management. Diagrams.

See also:
1457 (studies on Malathon toxicity)
1458 (studies on Chlordane toxicity)
1794 (quality control in paint industry)
2213 (automatic materials handling)
2259 (improved quality and increased production of sinters)
2415 (quality control in piston manufacture)
2708 (quality control for textiles)
2745 (requirements for and training of welding engineers)

PHYSICS

2573 Mull and Solvent Media for Infrared. Jesse S. Ard. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1743-1744.

12 ref.

2574 Ultraviolet Spectrophotometric Determination of Antimony as Iodoantimonous Acid. Anita Elkind, K. H. Gayer, and D. F. Boltz. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1744-1745.

Coexistence of an absorbancy maximum in the ultraviolet region with the previously known absorbancy maximum in the visible region was established for the iodoantimonous acid system. Graph, table. 4 ref.

2575 Lighting New Horizons. Roland Ward. *Chemical and Engineering News*, v. 31, Nov. 16, 1953, p. 4772-4775.

Discusses applications of phosphors in signalling devices, radiation detectors, and electroluminescent lamps. Photographs,

2576* Theory of Magnetic Amplifiers With Square-Loop Core Materials. H. F. Storm. *Communication and Electronics*, 1953, Nov., p. 629-637; disc., p. 637-640.

Operation of magnetic amplifiers is explained. Power out, power gain, and time constant of the amplifier are expressed in terms of core and rectifier properties. Diagrams, tables, graphs. 15 ref.

2577* Stressed Ferrites Having Rectangular Hysteresis Loops. H. J. Williams, R. C. Sherwood, Matilda Goertz, and F. J. Schnettler. *Communication and Electronics*, 1953, Nov., p. 531-537.

Reports results of experimental study of effect of stress on magnetic properties of ferrites. Diagrams, graphs, tables, photographs. 6 ref.

2578* Pulse Response Characteristics of Rectangular-Hysteresis-Loop Ferromagnetic Materials. Joseph Wylen. *Communication and Electronics*, 1953, Nov., p. 648-655; disc., p. 655-656.

Includes diagrams, tables, photographs. 12 ref.

2579* Application of Functional Analysis in the Theory of Sloped Thin Elastic Shells. (Russian.) V. S. Zhgenti. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 217-219.

Presents a theoretical discussion. 2 ref.

2580* Problem of Investigating the Critical Region of the System Liquid-Vapor by Ultrasonic Methods. (Russian.) V. Nozdrev. *Doklady Akademii Nauk SSSR*, v. 92, no. 6, Oct. 21, 1953, p. 1145-1148.

Presents results of experiments concerning speed of sound in critical region of certain organic substances. Graphs. 11 ref.

2581 Copper-Activated Zinc Sulfide Phosphors With Trivalent Substituents. H. C. Froelich. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 496-507.

Studies in emission spectra are reported. Graphs, tables. 5 ref.

2582 The Infra-Red Spectra and Molecular Structure of Some Group 6 Hexafluorides. J. Grant. *Faraday Society, Transactions*, v. 49, Oct. 1953, p. 1122-1131.

Reports similarity in spectra of hexafluorides of S, Se, Te, Mo, W, and U. Suggests all six compounds have some molecular structure. Graphs, tables. 23 ref.

2583* Effective Permeabilities of Regular Arrangements of Ferromagnetic Spheres. (German.) Ilse Lucas. *Frequenz*, v. 7, no. 10, Oct. 1953, p. 289-295.

Effective permeability was calculated for a chain of ferromagnetic spheres which either touch or are separated by intermediary layers of varying thickness. Validity of the calculation is tested experimentally. Results are discussed. Graphs, diagrams. 6 ref.

2584 Asymptotic Approximation for the Elastic Normal Modes in a Stratified Solid Medium. Norman A. Haskell. *Geophysics Research Directorate Geophysical Research Paper no. 22, Air Force Cambridge Research Center Technical Report*, 53-57, Aug. 1953, 23 p. (QC806 Un3g)

Comparisons of dispersion curves computed by the approximate theory with those computed by the exact theory indicates that the approximate theory is fairly accurate for normal modes of higher order than the fifth or sixth. Graphs. 7 ref.

2585 Complex Magnetic Permeability of Spherical Particles. James R. Wait. *I.R.E., Proceedings*, v. 41, Nov. 1953, p. 1664-1667.

Presents method of computing the above. Curves are presented which illustrate the dependence of the conductivity, permeability and radius of the particle, and the frequency. Graphs. 5 ref.

2586 Transient Response of the Grounded Base Transistor Amplifier With Small Load Impedance. J. S. Schaffner and J. J. Suran. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1355-1357.

Response of collector current to a step in emitter current will be calculated for grounded base stage with small load resistance. Graph.

2587 Traveling Wave Slot Antennas. V. H. Rumsey. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1358-1365.

Perturbation technique for solving variational equations is given. Formulas are worked out for rectangular wave guides. Good agreement with available measurements is obtained. Diagrams, graphs.

2588 Propagation Along a Slotted Cylinder. Roger F. Harrington. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1366-1371.

Presents variational method of determining attenuation and phase constants for fields along a slotted wave guide. Graphs, diagrams.

2589 An Influence Function for the Beta Activity of Uranium-235 Fission Products. J. Kendall Thornton and William J. Houghton. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1374-1378.

Includes graphs, tables. 8 ref.

2590 Graphical Analysis of Nonlinear Circuits Using Impedance Concepts. John S. Thomsen. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1379-1382.

Presents method of analyzing LRC circuits with nonlinear reactances which employs the concept of impedance and thus parallels linear circuit treatment as far as possible.

2591 Enhanced Alpha in Formed Silicon Point Contact Transistors. Harold Jacobs, Wesley Matthei, and Frank A. Brand. *Journal of Applied Physics*, v. 11, Nov. 1953, p. 1410-1411.

Includes graphs, tables. 3 ref.

Physics

2592 Precise Theory of the Absorption and Dispersion of Forced Plane Infinitesimal Waves According to the Navier-Stokes Equations. C. Truesdell. *Journal of Rational Mechanics and Analysis*, v. 2, Oct. 1953, p. 643-731.

Presents mathematical treatment of properties of ultrasonic waves. Diagrams, tables, graphs. 72 ref.

2593 Refractive Index of Cesium Bromide for Ultraviolet, Visible, and Infrared Wavelengths. William S. Rodney and Robert J. Spindler. *Journal of Research, National Bureau of Standards*, v. 51, Sept. 1953, p. 123-126.

Index of refraction of cesium bromide was measured at 37 wavelengths from 0.365 to 39.22 microns. Minimum deviation method was used. Entire range was covered with a single instrument. Photographs, tables, graphs. 9 ref.

2594* Simultaneous Oscillations of a Quartz Crystal at Various Frequencies. Krishna Gopal Erivastava. *Journal of Scientific & Industrial Research*, v. 12, sec. A, Sept. 1953, p. 393-395.

Studies were made of the diffraction of light produced by ultrasonic waves in organic solvents. Diffraction patterns showed presence of a number of harmonics and other frequencies. Diffraction photographs, diagram, table. 6 ref.

2595* Ultrasonic Grating Remaining After the Stopping of the Ultrasonic Waves. IV. (English.) A. Carrelli and F. Porreca. *Nuovo cimento*, v. 10, ser. 9, no. 10, Oct. 1953, p. 1406-1414.

Discusses diffracted lines in liquids containing solid particles. Grating conforms to periodic variation in refractive index of the mixture. Diagrams, graphs, tables. 10 ref.

2596* A New 6100-A Band in Zinc Orthosilicate Activated With Manganese. P. Zalm and H. A. Klasens. *Philips Research Reports*, v. 8, Oct. 1953, p. 386-392.

Discusses conditions under which new emission band is observed. Describes some of its properties. Graphs. 20 ref.

2597* A New Method to Determine Short Decay Times of Phosphors Excited With Ultraviolet Light. A. Bril, H. A. Klasens, and P. Zalm. *Philips Research Reports*, v. 8, Oct. 1953, p. 393-396.

Describes method using cathode ray tube with ultraviolet-emitting phosphors as a light source. Graphs, diagram, photographs. 7 ref.

2598* Three Methods of Measuring Magnetic Fields. I. Measurement Based on the Generator Principle. B. F. Jürgens. **II. Measurement of the Field on the Axis of Magnetic Electron Lenses.** A. C. van Dorsten and A. J. J. Franken. **III. Measurement by the Proton Resonance Method.** H. G. Beljers. *Philips Technical Review*, v. 15, Aug. 1953, p. 49-62.

Best method of measuring magnetic field strength depends on characteristics of the field. Describes a method suitable for most magnetic circuits and accurate to 2 or 3%, another developed specially for magnetic electron lenses, and a third for very accurate absolute measurement of fairly strong homogeneous fields. Photographs, diagrams, table. 9 ref.

2599 The Dielectric Properties of Barium Titanate Single Crystals in the Region of Their Uper Transition Temperature. L. E. Cross. *Philosophical Magazine*, v. 44, 7th ser., no. 357, Oct. 1953, p. 1161-1170.

Reports measurements of optical dielectric effects in both twinned and untwinned crystals of barium titanate. Graphs. 11 ref.

2600 Some Electrical and Optical Properties of Synthetic Single Crystals of Zinc Sulfide. William W. Piper. *Physical Review*, v. 92, ser. 2, Oct. 1, 1953, p. 23-27.

Reports the fundamental optical absorption edge, temperature dependence of electrical conductivity, and photoconductivity near the absorption edge for hexagonal ZnS. Graphs. 28 ref.

2601 Optical Absorption and Photoconduction in the Visible and Near Infrared in Single Crystals of BaO. William C. Dash. *Physical Review*, v. 92, ser. 2, Oct. 1953, p. 68-76.

Bands at 0.8 and 1.4 e.v., induced by ultraviolet or X-rays at —160 C., are indicated. Photoconduction studies show energy levels at 2.0 and 2.6 e.v. Diagrams, graphs. 14 ref.

2602 Luminescence Studies of KI-Tl. Bernard Smaller and Eugene Avery. *Physical Review*, v. 92, ser. 2, Oct. 1953, p. 232-237.

Characteristics of electron traps present in KI-Tl phosphor were investigated. Graphs. 16 ref.

2603 Sensitive Hall Measurements on NaCl and on Photoconductive PbTe. John L. Levy. *Physical Review*, v. 92, ser. 2, Oct. 15, 1953, p. 215-218.

Includes table, diagram. 7 ref.

2604 Basic Principles of Stereophonic Sound. William B. Snow. *Society of Motion Picture and Television Engineers, Journal*, v. 61, Nov. 1953, p. 567-587; disc., p. 587-589.

Summarizes fundamental theory and gives examples of how theory is employed in representative practical situations. Diagrams. 68 ref.

2605 A Spectrophotometric Atlas of the $^2\Sigma \pm {}^2\Pi$ Transition of OH. Arnold M. Bass and Herbert P. Broida. *U. S. National Bureau of Standards Circular* 541, June 26, 1953, 22 p. (T21 Un3c)

Compares various methods of studying intensity distributions in atomic spectra and among rotational lines of electronic band spectra. Development of sensitive photoelectric multiplier tubes has made it feasible to use the direct-resolution spectrometry between 1800 and 7000 A. Graphs. 5 ref.

2606* Absorption of Ultrasonic Waves in Liquids and Molecular Mechanism of Volumetric Viscosity. (Russian.) I. G. Mikhailov and V. A. Solov'ëv. *Uspekhi Fizicheskikh Nauk*, v. 50, no. 1, May 1953, p. 3-50.

Concludes that to apply experimental data to study of molecular processes responsible for relaxation it is necessary to separate relative influence of various relaxation mechanisms. Diagrams. 34 ref.

2607* Magneto-Optical Phenomena in Ferromagnets (Macroscopic Theory.) (Russian.) A. V. Sokolov. *Uspekhi Fizicheskikh Nauk*, v. 50, no. 2, June 1953, p. 161-196.

Describes construction and use of macroscopic models. Diagrams, graphs. 21 ref.

2608* Deformation Effect of Lattices by Electrons on the Optical and Electrical Properties of Crystals. (Russian.) S. I. Pekar. *Uspekhi Fizicheskikh Nauk*, v. 50, no. 2, June 1953, p. 197-252.

Discusses problem of microtheory of nonmetallic crystals of dielectrics and semiconductors. Graphs, tables. 48 ref.

2609* The Luminescense of Monovalent Thallium Halide and Bivalent Lead Halide at Low Temperatures. (German.) H. Gobrecht and F. Becker. *Zeitschrift für Physik*, v. 135, no. 5, 1953, p. 553-557.

Experiments revealed that halides of monovalent Tl and bivalent Pb turn fluorescent at —180 C if they absorb slight traces of water. Thallium halides fluoresce at —190 C upon grinding of their crystals. Tables. 4 ref.

Books and Miscellaneous Publications

2610 Mathematical Physics. Donald H. Menzel. 412 p. 1953. Prentice Hall, New York. (QC20 M52m)

Covers primarily classical physics, specially emphasizing those topics closely related to modern phases, either in technique or subject matter.

See also:

1536 (ferroelectric properties of lead metaniobate)
1629 (separation of fission products)
2465 (metallography of radioactive materials)
2637 (plastic insulators)

PLASTICS

2611 Adhesives for Plastic Materials. *Adhesives & Resins*, v. 1, Oct. 1953, p. 227-230.

Discusses bonding of both thermosetting and thermoplastics materials. Tables. 5 ref.

2612 Statistical Mechanics of Dilute Polymer Solution. V. Evaluation of Thermodynamic Interaction Parameters from Dilute Solution Measurements. W. R. Krigbaum and P. J. Flory. *American Chemical Society, Journal*, v. 75, Nov. 1953, p. 5254-5259.

Includes graphs. 17 ref.

2613* Electrical Properties of Plastics. Molecular Structure and Electrical Properties. (Dutch.) P. Wiarda. *Bedrijf en Techniek*, v. 8e, no. 187, Oct. 24, 1953, p. 172-175.

Characterizes connection between molecular structure and electric properties. Problem of the absence of materials with extremely high dielectric constants in organic chemistry is outlined.

2614 Phenolic Foam Resin. *Canadian Chemical Processing*, v. 37, Oct. 1953, p. 74, 76.

Discusses chemical and physical properties which make it useful for home insulation, commercial refrigeration insulation, packaging fragile items, noise reduction and soil-less culture. Diagrams.

2615* Plastics That Expand to Fill Poduct Needs. Annesta R. Gardner. *Dun's Review and Modern Industry*, v. 62, Nov. 1953, p. 54-59.

Discusses production and uses of foamed plastics. Photographs, diagram.

2616 How Plastics Can Help Mining. L. A. Roe. *Engineering and Mining Journal*, v. 154, Nov. 1953, p. 88-89, 192.

Reports plastics industry offers new markets for metals and minerals for such uses as stabilizers and pigments. Photographs, tables. 8 ref.

2617* Vacuum Forming of Thermoplastic Sheets. Sanford S. Zimmerman. *Indian Rubber World*, v. 129, Nov. 1953, p. 216-219.

Describes a simple, rapid cycle method of forming thermoplastic sheets by means of heat and a combination of vacuum and atmospheric pressure. Diagrams, photographs.

2618 Evolution of Halides From Halogenated Plastics Exposed to Gamma Radiation. Joseph Byrne, T. W. Costikyan, C. B. Hanford, D. L. Johnson, and W. L. Mann. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2549-2552.

Shows that considerable halide is evolved. Polyvinyl chloride performs better than "Fluorothene". Table, graphs. 5 ref.

2619 Excluded Volume in Polymer Chains. B. H. Zinn, W. H. Stockmayer, and M. Fixman. *Journal of Chemical Physics*, v. 21, Oct. 1953, p. 1716-1723.

Discusses mathematical problem of random flights with correlations between flights, which is of importance in relating mean size of a chain to its structure. Diagrams. 20 ref.

2620 Viscosities of Concentrated Polymer Solutions. III. Polystyrene and Styrene-Maleic Acid Copolymer. John D. Ferry, Lester D. Grandine, Jr., and Doyle C. Udy. *Journal of Colloid Science*, v. 8, Oct. 1953, p. 529-539.

Describes measurements on solutions of polystyrene in Decalin and in xylene, and of a copolymer of styrene and maleic acid in 50% aqueous dioxane. Compared the behavior of four polymers. Tables, graphs. 13 ref.

2621* Mechanism of the Crystallization of High Polymers. G. Schuur. *Journal of Polymer Science*, v. 11, Nov. 1953, p. 385-398.

Attempts to account for the origin of spherulites. Diagrams, micrographs. 19 ref.

2622 Dielectric Relaxation in a Styrene-Acrylonitrile Copolymer During and After Its Polymerization. Paul Ehrlich and Nicholas J. De Lollis. *Journal of Research, National Bureau of Standards*, v. 51, Sept. 1953, p. 145-154.

Studies were made by mesurements of dielectric constant and loss factor at several frequencies from 100 cycles per sec. to 100 kc. per sec. Diagrams, graphs, tables. 20 ref.

2623 Study of Degradation of Polystyrene, Using Ultraviolet Spectrophotometry. Mary Jane Reiney, Max Tryon, and B. G. Achhammer. *Journal of Research, National Bureau of Standards*, v. 51, Sept. 1953, p. 155-165.

Exposure of pure polystyrene to ultraviolet radiant energy resulted in increased absorption in the ultraviolet region of 280 to 400 Mμ. Tables, graphs, diagrams. 18 ref.

2624 Dielectric Properties of Teflon From Room Temperature to 314 C and From Frequencies of 10^2 to 10^5 c/s. Paul Ehrlich. *Journal of Research, National Bureau of Standards*, v. 51, Oct. 1953, p. 185-188.

Experimental results show that dielectric constant decreases with increasing temperature. Graphs, table. 9 ref.

2625* Specific Heat, Specific Volume, and Thermal Conductivity of High Polymers. III. Polystyrenes Reticulated With Divinyl Benzene. (German.) Kurt Ueberreiter and Evelyn Otto-Laupenmühlen. *Kolloid-Zeitschrift*, v. 133, no. 1, Oct. 1953, p. 26-32.

Includes graphs. 9 ref.

2626* Bascodur. A New Material for Chemical Apparatus. (German.) Werner Kunzer and Karl Vogel. *Kunststoffe*, v. 43, no. 10, Oct. 1953, p. 376-379.

Suggestions for processing and using new plastic are presented.

2627* Vinyl Carbazole and Polyvinyl Carbazole. (German.) H. R. Jacobi. *Kunststoffe*, v. 43, no. 10, Oct. 1953, p. 381-386.

Describes uses in d.c. and a.c. condensers. Discusses chemical resistance and dielectric properties. Tables, diagrams, photographs. 22 ref.

2628* Ethoxylin Resins in High-Voltage Insulators. (German.) Konrad Meyerhans. *Kunststoffe*, v. 43, no. 10, Oct. 1953, p. 387-392.

Describes high-quality insulating properties possessed by resins. Comparisons were made with porcelain. Tables, graphs, photographs. 8 ref.

2629* Impact Resistant Polystyrene. (German.) Hans Mair. *Kunststoffe*, v. 43, no. 10, Oct. 1953, p. 497-399.

Discusses properties, processing, and uses. Polystyrene-butadiene copolymers show high mechanical properties. Tables, graphs.

2630* Consideration of Molecular Models on the Solubility of High Polymers. (German.) O. Fuchs. *Kunststoffe*, v. 43, no. 10, Oct. 1953, p. 409-415.

Discusses differences in solubility of low- and high- molecular compounds.

2631* Investigations of Synthetic Resins by Means of Polarized Light. (German.) Siegmund Wintergerst. *Kunststoffe*, v. 43, no. 10, Oct. 1953, p. 415-417.

Studies were made of internal stresses for quality and production control. Diagrams, micrographs.

2632* Plastics Processing. *Lubrication*, v. 39, Nov. 1953, p. 129-140.

Reviews various types of plastics and equipment, procedures, and lubricants for molding them.

2633 New Phenolic-Glass Laminates for Elevated Temperatures. John B. Campbell. *Materials & Methods*, v. 38, Nov. 1953, p. 87-91.

Describes production, properties, advantages, limitations, and structural applications in the 300 to 500 F range. Graphs. diagrams.

2634 New Silicone Resin, Foamed in Place, Is High Temperature Insulator. *Materials & Methods*, v. 38, Nov. 1953, p. 96-97.

Discusses properties and applications. Photographs.

Plastics

2635 Melamine-Formaldehyde Molded Plastics. *Materials & Methods,* v. 38, Nov. 1953, p. 139, 141.

Tabulates properties and uses of 9 types corresponding to ASTM Spec. D704-51T.

2636 Polytetrafluoroethylene, Its Properties and Uses. L. W. Cornell. *Mechanical Engineering,* v. 75, Nov. 1953, p. 883-886.

Methods of fabrication; forms available; electrical, chemical, physical, and mechanical properties; and applications of "Teflon" are discussed. Photographs, tables.

2637 Preparation and Performance of Efficient Plastic Scintillators. Warren L. Buck and Robert K. Swank. *Nucleaonics,* v. 11, Nov. 1953, p. 48-52.

Describes production by polymerization of styrene and vinylstyrene solutions of organic fluors. Scintillation decay time is $8x10^{-9}$ sec. or less; pulse height is comparable to that of fast organic crystals. Graphs, photographs. 16 ref.

2638 New All-Plastic Pipe Line Handles Montana Crude. *Oil and Gas Journal,* v. 52, Nov. 23, 1953, p. 72-73.

Butyrate plastic pipe was chosen for its ability to resist corrosion and paraffin clogging. Photographs.

2639 The Relation Between Stress, Strain and Birefringence in Some High Polymers. S. M. Crawford. *Physical Society, Proceedings,* v. 66, no. 406B, Oct. 1953, p. 884-886.

Shows, by simultaneous measurements, that in "Terylene" birefringence is a function of stress and strain. Birefringence in polyethylene and "Perspex" is a single valued function of strain. Tables, graphs. 5 ref.

2640 Plastics in Prefabricated Buildings. J. B. Singer. *Plastics,* v. 18, Nov. 1953, p. 371-374.

Notes on some new developments in the use of plastics in the building industry.

2641 The Rate of Strain Factor in Relation to the Impact Strength Properties of Plastics. R. N. Haward. *Plastics,* v. 18, Nov. 1953, p. 382-386.

Effect of rate of strain on energy required to fracture plastics materials is reviewed. It is concluded that at highest rates of strain the stresses imposed are such that the rate of fracture overtakes the rate of strain. Graphs, photographs. 26 ref.

2642* Polymer Research. I. Goodman. *Research,* v. 6, Nov. 1953, p. 428-433.

Reviews polymer science and industry. Discusses "block" or "graft" copolymers and structural isomorphism in polymers, and indicates probable significance of their future application. 13 ref.

2643* Cyclic Oligomers of Caprolactam. (English.) P. H. Hermans. *Recuel des travaux chimiques des Pays-Bas,* v. 72, nos. 9-10, Sept.-Oct. 1953, p. 798-812.

Discusses investigation and tenative identification of the extractable low-molecular products. Tables, photographs, micrographs. 9 ref.

2644* Crazing Characteristics of Polystyrene. *Rubber Age and Synthetics,* v. 34, Oct. 1953, p. 351, 355.

Several aspects of this failure are discussed.

2645* Epoxy Resins. II. New Applications for a Plastics Material. *Rubber Age and Synthetics,* v. 34, Oct. 1953, p. 353-355.

Discusses Epikote 828 and 834. Tables.

2646* Glass Fabrics as Used by the Plastics Industry. II. Some End-Use Aspects of Fabric Structure. B. J. Brown. *Rubber Age and Synthetics,* v. 34, Oct. 1953, p. 359-361.

Describes properties and treatment of fabrics for plastics reinforcement. Tables, diagrams. (To be continued.)

2647 Will Glass-Reinformed Plastics Replace Metal in Automobile Construction? (If so, When and Where?) Games Slayter. *SAE Preprint* no. 9, 1953, 5 p. (TL1 Sol3p)

Discusses physical properties, price, supply, and repair costs.

2648 Problems, Production and Techniques of Laminated Fiberglass. I. M. Scott. *SAE Preprint* no. 10, 1953, 7 p. (TL1 Sol3p)

Discusses ways in which plastics can replace less plentiful materials. Describes molding of glass-reinforced plastics and applications of laminated products in automobiles and chemical equipment.

2649 The Cement of Reinforced Plastics for the Automotive Industry. E. S. Ebers. *SAE Preprint* no. 11, 1953, 5 p. (TL1 Sol3p)

Reports performance of glass fiber reinforced polyester (Numa) bodies with service life of 28,000 miles. Diagrams, graphs, tables.

2650* A Symposium on Vinyl Compounding. I. *SPE Journal,* v. 9, Nov. 1953, p. 20-24.

Presents questions and answers on mixing, molding, compounding, and extrusion. (To be concluded.)

2651 The Use of Tin in P.V.C. Pipes. H. Verity Smith. *Tin and Its Uses,* 1953, no. 29, p. 7-8.

Discusses advantages of rigid vinyl plastic pipe over traditional materials. Describes its manufacture and use of tin compounds for stabilization of the polymer. 6 ref.

2652* Investigation of the Mechanical Properties of Crystalline Polymers. II. Polyethylenes. III. Copolymers of Vinyl Chloride With Chloro-Vinylidene and Gutta-Percha. (Russian.) V. A. Kargin and T. I. Sogolova. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 8, Aug. 1953, p. 1208-1216.

Includes tables, graphs. 6 ref.

2653* Packing Density of High-Polymer Compounds. (Russian.) V. S. Klimenkov, V. A. Kargin, and A. I. Kitaigorodskii. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 8, Aug. 1953, p. 1217-1227.

Packing density is determined mainly by the flexibility or rigidity of the chains and not by intermolecular reactions. Tables.

See also:

1657 (analysis of alkyd resins)
1715 (effects of detergents on polymers)
1771 (silyl derivatives of starch)
1902 (plastic insulation of electric cables)
2414 (plastic dies for metal stamping)
2418 (plastic dies)
2423 (plastic drawing dies)
2700 (impregnation of textiles)
2704 (resins for textile pigments)
2778 (treatment of cellulose fibre)

POLLUTION AND WASTES

2654* Synthetic-Detergent Pollution in Kansas. Russell L. Clup and Howard A. Stoltenberg. *American Water Works Association, Journal,* v. 45, Nov. 1953, p. 1187-1195.

Describes laboratory and plant tests conducted by Kansas State Board of Health. Graph, photographs, tables. 11 ref.

2655* Technique of Bacterial Examination of Water With Molecular Filter Membranes. *American Water Works Association, Journal,* v. 45, Nov. 1953, p. 1196-1210.

Summarizes present status of and outlines recommendations for examination of bacterial water with molecular filter membranes. Photographs, diagrams, table. 20 ref.

2656* Disposal of Wastes From Filter Plants and Coagulation Basins. John B. Dean. *American Water Works Association, Journal,* v. 45, Nov. 1953, p. 1226-1237.

Character, weight, and volume of wastes; handling of sludge fills and beds; effect of purification wastes on streams; and state regulation of waste disposal are covered. Tables.

2657* Algae Control in Small Water Plants. D. H. Matheson. *American Water Works Association, Journal,* v. 45, Nov. 1953, p. 1238-1244.

Subject is considered particularly from the view point of the small-plant operator.

2658* Absolute Method of Sampling and Measurement of Solid Air-Borne Particulates. David A. Fraser. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Nov. 1953, p. 412-419.

Simple, inexpensive, laboratory-made holders for molecular filter membrane are described. Particle-size distributions obtained by the new method and by standard optical techniques are critically compared and analyzed. Graphs, photographs.

2659 Alcohol From Sulphite Waste Liquor. Improvements in Its Manufacture During the Last Ten Years. H. G. Joseph. *Chemistry in Canada*, v. 5, Nov. 1953, p. 226-230.

Outlines process of manufacturing industrial alcohol from waste sulfite liquor. Diagrams, photographs. 5 ref.

2660* Stack Considerations for Large Power Plants. H. L. Von Hohenleiten and R. H. Kent. *Electric Light and Power*, v. 31, Nov. 1953, p. 100-103, 205-206.

Discusses design and characteristics of various types of stacks for maximum dispersion of combustion products. Graphs, table. 9 ref.

2661 Semiempirical Equation of Electrostatic Precipitation. Eric A. Walker and John E. Coolidge. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2417-2422.

An equation for efficiency of precipitation is developed. Relates relative humidity, applied voltage, partical-size distribution, length of unit, and velocity. Photograph, diagrams, tables, graphs. 6 ref.

2662* Flow-Through Treatment of Metal Industry Wastes. Frank J. Hendel and V. T. Stewart. *Sewage and Industrial Wastes*, v. 25, Nov. 1953, p. 1323-1330.

Describes process using automatic equipment for neutralization of acids by lime or soda; reduction of chromium by sulfur dioxide; and oxidation of cyanides by chlorine. Photographs, tables. 7 ref.

2663* Charting a Course for the Future of Stream Pollution Control. Kenneth S. Watson. *Water & Sewage Works*, v. 100, Nov. 1953, p. 421-425.

Points out shortcomings in present practices.

See also:
1490 (sewage as fertilizer)
1679 (analysis of waste gases)
2568 (quality control in waste treatment)
2784 (properties of sulfite waste liquor)

RUBBER AND ELASTOMERS

2664 Simple Flexibility Test. Dietrich G. Stechert. *Analytical Chemistry*, v. 25, Nov. 1953, p. 1730-1733.

Proposes a simple test for flexural rigidity. Photograph, diagrams, tables.

2665* Active Carbons as Anti-Strain Agents for Reclaimed Rubber. J. J. Keilen and W. K. Dougherty. *India Rubber World*, v. 139, Nov. 1953, p. 199-205.

Paper presented before the Div. of Rubber Chemistry, ACS, Buffalo, N. Y., Oct. 29, 1952. Diagrams, graphs, table.

2666* Product and Mold Designing Toward Lower Ultimate Cost. J. K. Mason. *India Rubber World*, v. 129, Nov. 1953, p. 206-208.

Describes typical cases in the rubber industry.

2667* Development of the Activated Hydroperoxide-Dextrose Formula for Hot Rubber. R. F. McCann, R. W. Laundrie, D. Druesedow, and R. S. Reynolds. *India Rubber World*, v. 129, Nov. 1953, p. 209-212, 214.

Includes tables. 11 ref.

2668 Chemigum SL—An Elastomeric Polyester-Urethane. N. V. Seeger, T. G. Mastin, E. E. Fauser, F. S. Farson, A. F. Finelli, and E. A. Sinclair. *Industrial and Engineering Chemistry*, v. 45, Nov. 1953, p. 2538-2542.

No butadiene or styrene is used. Vulcanized gum has a tensile strength of 5450 psi., elongation of 750%, and abrasion resistance twice that of cold rubber. Photographs, graphs, tables. 20 ref.

2669* Ozone Cracking: A Cinematographic Study. Doreen M. Smith and V. E. Gough. *Institution of the Rubber Industry, Transaction*, v. 29, Oct. 1953, p. 219-237.

A time-lapse study of ozone attack on rubber at 30, 15, and 7.5% strain is described. Photographs, tables, graphs. 8 ref.

2670* Yield Stress in Frozen Rubbers. J. M. Buist and R. L. Stafford. *Institution of the Rubber Industry, Transactions*, v. 29, Oct. 1953, p. 238-254.

Shows that yield stress is dependent on time of storage at —40 C. Shear deformation and X-ray studies are made. Photographs, tables, graphs. 6 ref.

2671* Non-Destructive Examination of Flat Bonded Rubber Mountings. D. M. Heughan, D. O. Sproule. *Institution of the Rubber Industry, Transactions*, v. 29, Oct. 1953, p. 255-265.

Describes ultrasonic technique of detecting flaws under only 10% strain. Oscillograms, photographs, diagrams. 5 ref.

2672* Non-Linearity in the Dynamic Properties of Vulcanised Rubber Compounds. W. P. Fletcher and A. N. Gent. *Institution of the Rubber Industry, Transactions*, v. 29, Oct. 1953, p. 266-280.

Determines dynamic properties of rubber containing various amount and types of fillers. Graphs. 5 ref.

2673* Rubber in Railway Construction. I. Rubber in Self-Propelled Railway Cars. (German.) O. Taschinger. **II. Rubber in Railway Coaches.** A. Mielich. *Kautschuk und Gummi*, v. 6, no. 10, Oct. 1953, p. 225-228.

Includes diagrams, photographs. (To be continued.)

2674* Some Examples for the Microscopic Investigation of the Rupture Process (Micro-Rupture Test). (German.) J. Kruse. *Kautschuk und Gummi*, v. 6, no. 10, Oct. 1953, p. WT202-WT205.

Describes production of rubber specimens. Expansion behavior of carbon-black clouds and microscopic investigations on breakage surfaces are discussed.

2675* Siliceous Chalk and Its Role in the Rubber Industry. (German.) Otto Grünfeld. *Kautschuk und Gummi*, v. 6, no. 10, Oct. 1953, p. WT205-WT210.

Discusses chemical and physical properties of siliceous chalk. Describes its use in the rubber industry, synthetic and natural rubber mixtures, polyvinylchloride, and latex. Tables, micrographs.

2676 Specifying Elastomers for Low Temperature Service. *Materials & Methods*, v. 38, Nov. 1953, p. 114-118.

Discusses what happens to rubbers at low temperatures, how common elastomers differ in their low temperature behavior, and how they can be altered to meet specific low temperature conditions. Photographs, graphs, tables.

2677 Progress in the Manufacture of Molded-Rubber Products. J. H. Gerstenmaier and F. J. Fetter. *Mechanical Engineering*, v. 75, Nov. 1953, p. 877-882.

Describes preparation of uncured rubber; metal preparation; mold design; curing and finishing processes; and inspection and testing. Photographs.

2678 Surface Condition and Electrical Impedance in Rubber Friction. A. Schallamach. *Physical Society, Proceedings*, v. 66, no. 406B, Oct. 1953, p. 817-825.

Shows that a layer of rubber only a few thousandths of a cm. thick develops high electrical impedance during frictional gliding. Such a layer is permanent in abraded rubber. Graphs. 10 ref.

2679* Plasticizers for Natural Rubber. (Polish.) S. Zielinska. *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 527-530.

Describes a series of plasticizers used regularly in natural and synthetic rubber production. Graph, tables. 4 ref.

2680* The Neoprene Latices. III. Their General Characteristics, Compounding and Processing. W. G. Vennels. *Rubber Age and Synthetics*, v. 34, Oct. 1953, p. 341, 342.

Tabulates effects of fillers and softeners on stress-strain properties of neoprene. Tables. (To be continued.)

Rubber and Elastomers

2681* Paper that is Non-Adherent to Rubber. R. W. Moncrieff. *Rubber Age and Synthetics*, v. 34, Oct. 1953, p. 357.

Describes process from preparation of silicone polymers to testing of paper.

Books and Miscellaneous Publications

2682 Latex in Industry. Royce J. Noble. 2nd Ed. 912 p. 1953. Rubber Age, New York. (TS1890 N66L2)

Part I covers sources, preservation, shipment, properties, and concentration of latex; aqueous dispersion; synthetic latices; vulcanized latex; compounding; coagulation of latex composition; and vulcanization. Part II the technical application of latex, impregnation, spreading, dipping processes, molding (casting), electrodeposition, paper and latex, artificial leather, rubber thread, porous rubber, friction elements, adhesives, latex-treated rugs and plush, and miscellaneous applications. Part III the examination of latex and latex compounds.

See also:
1902 (rubber insulation of electric cables)
2700 (impregnation of textiles)
2724 (rubber adhesives)

SPACE HEATING AND CONDITIONING

2683* Air Conditioning and the Offset Process. Paul J. Hartsuch. *American Pressman*, v. 63, Nov. 1953, p. 28, 32, 52.

Describes advantages in photography, litho platemaking, and in the pressroom.

2684 The Case of the Rooftop Robots. *Buildings*, v. 53, Dec. 1953, p. 36.

Describes "seeing-eye" mechanism on the roof of a large hotel which automatically adjusts a building's air conditioning as the sun shifts.

2685* How Air Conditioning Improves Offset Production. Paul J. Hartsuch. *Canadian Printer and Publisher*, v. 62, Nov. 1953, p. 44, 46.

Photo-film can be held to proper size for close-register. Ink and paper can be controlled with proper air-conditioning equipment.

2686 The Manufacturers Life Building. A New Concept for Comfort Conditioning. *Consulting Engineer*, v. 2, Nov. 1953, p. 24-27.

Describes structural features, air supply, and cooling and heating systems. Photographs.

2687* Characteristics of the Electric Space Heating Load in the Province of Quebec. Gerald Trudel. *Engineering Journal*, v. 36, Oct. 1953, p. 1315-1319.

Describes use of load regulator combined with individual thermostats which makes controlled electric space heating a profitable load for the utility. Graph, tables.

2688* Minneapolis-Honeywell Controls. J. W. Schulz. *Fueloil & Oil Heat*, v. 12, Nov. 1953, p. 65-70, 164, 166.

Traces the rise of Minneapolis Heat Regulator Co., from a struggling young firm in a brand new field to the mightiest producer of oil heat controls responsible for many of todays practices. Photographs, diagram.

2689 Costs of Operating the Heat Pump in the Equitable Building. J. Donald Kroeker and Ray C. Chewning. *Heating, Piping & Air Conditioning*, v. 25, Nov. 1953, p. 135-144.

Energy costs are compared with normal available energy sources. Diagram, photographs, tables, graphs.

2690 Room Air Distribution Research for Year 'Round Air Conditioning. II. Supply Outlets at Three Floor Locations. H. E. Straub and S. F. Gilman. *Heating, Piping & Air Conditioning*, v. 25, Nov. 1953, p. 145-154.

Describes studies in air circulation within a test room made over a range of flow rates under winter heating, isothermal, and summer cooling operating conditions. Discusses use of several sizes of floor registers and diffusers. Photograph, diagrams, tables.

2691 Odor Control Allows Recirculation and Reduces Laboratory Air Requirements. Joseph E. Leininger. *Heating and Ventilating*, v. 50, Nov. 1953, p. 72-73.

Describes use of various types of activated carbon filters capable of purifying contaminated air. Table.

2692 Ventilation and Air Conditioning for Laboratories. J. E. York. *Heating and Ventilating*, v. 50, Nov. 1953, p. 80-86.

Requirements of individual laboratories based on special equipment used and variety of tests are discussed. Photographs.

2693* Mechanical Refrigeration. VI. The Application of Thermodynamic Principles to Refrigeration Processes, Principles of Heat and Vapour Transfer. Neville S. Billington. *Modern Refrigeration*, v. 56, Oct. 1953, p. 381-387.

Discusses conduction of heat; insulating materials; two dimensional heat flow; periodic and transient flow; and vapour transfer. Diagrams, tables.

2694* Year-Round Air Conditioned Homes. J. C. Woodson. *Refrigerating Engineering*, v. 61, Nov. 1953, p. 1177-1181, 1262, 1264, 1266, 1268.

Discusses current types of equipment and application trends. Graph, diagrams, photographs.

2695 Fan Motors for Air Conditioners. M. D. Irwin. *Refrigerating Engineering*, v. 61, Nov. 1953, p. 1188-1189, 1193, 1260.

Discusses the overall problem of motor application to packaged air conditioning equipment.

2696* Design of Exhaust Systems. F. H. Stebbins. *Sheet Metal Worker*, v. 45, Nov. 1953, p. 67-70.

Explains design and use of several types of hoods and of a hood and boot used together. Diagrams, tables. (To be continued.)

2697* Some Scientific Thoughts on Space Heating. R. J. Sarjant. *South African Mining and Engineering Journal*, v. 64, pt. 11, Oct. 17, 1953, p. 225, 227.

Presents general discussion of developments to date and problems yet to be solved.

2698 Heat Emission Characteristics of Warm-Air Perimeter Heating Ducts. John R. Jamieson, Robert W. Roose, Herbert T. Gilkey, and Seichi Konza. *University of Illinois Bulletin, (Engineering Experiment Station Bulletin Series* no. 412,) v. 50, no. 68, May 1953, 84 p. (T1 16b)

Studies were made to determine temperature distribution and heat emission at the floor surface; temperature drop of air flowing through ducts embedded in concrete floor; magnitude and distribution of heat losses to the ground; effect of floor coverings; heat transfer lag; effect of windows on temperature within the room; air delivery; and durability of materials for edge insulation. Tables, graphs, micrographs, diagrams. 21 ref.

Books and Miscellaneous Publications

2699 Wool Shrinkage and Its Prevention. R. W. Moncrieff. 576 p. 1953. National Trade Press Ltd., London. (TS1547 M74w)

A useful reference book for the woolen industry and helpful source of information for manufactures and spinners of artificial and synthetic fibers, as well as for the laundering, dry cleaning, and tailoring trades.

2700 The Application of Vat Dyes. AATCC Monogram no. 2. 448 p. 1953. American Association of Textile Chemists and Colorists, Lowell, Mass. (TP897 Am35a)

Includes chapters on history; principles of vat dye application; application to cotton raw stock, cotton skeins, cotton warps, cotton packages, and cotton piece goods; hosiery; application to fibers other than cotton; general principles of printing; printing; indigo; use of vat dyes as pigments or in non-textile applications; leucoesters of vat dyestuffs; and tabulation of vat dyestuffs.

See also:
1854 (low power factor in air conditioning)
2614 (phenolic foam resin insulating materials)
2721 (Freon-11 refrigerants)

TEXTILES AND FIBERS

2701* Decrystallized Cotton. George Susich. *American Dyestuff Reporter*, v. 42, Oct. 26, 1953, p. 713-718.

Presents a condensation of Textiles Report no. 79, OTS. U. S. Dept. of Comm., Washington, D. C. Reduced crystallinity increased extensibility and energy necessary for rupture. Wet recovery of native cotton was improved without markedly sacrificing advantageous properties. Tables, graphs, micrographs, diagrams. 16 ref.

2702* Some Aspects of Detergency and Detergent Testing. R. E. Wolfrom and A. C. Nuessle. *American Dyestuff Reporter*, v. 42, Nov. 9, 1953, p. P753-P762.

Discusses detergency tests and methods of scouring wool and cotton stock. Photographs and tables. 11 ref.

2703 New Tools for the Fabric Technologist. Robert K. Kennedy. *Canadian Chemical Processing*, v. 37, Oct. 1953, p. 110-111.

Discusses "Inner Structure" technique for studying the properties and performance characteristics of new fibers.

2704 Resins in Textile Pigment Printing. Jerome Fine. *Interchemical Review*, v. 12, Autumn 1953, p. 59-68.

Describes uses of resins as water-in-oil emulsifying agents, as water thickeners, and as binders for pigments. Graphs, photographs, tables.

2705* Technical Progress in Viscose Fiber Industry. (Polish.) K. Hempel. *Przemysl Chemiczny*, v. 32, no. 10, Oct. 1953, p. 531-535.

Describes improvement of existing methods in process of alkalizing, maturing, disintegrating, coagulation, desulfurization, and preparation of alkalicellulose. Diagrams. 26 ref.

2706* The Dyeing of Viscose Rayon at High Temperatures. K. Butterworth. *Society of Dyers and Colourists, Journal*, v. 69, Oct. 1953, p. 362-370; disc., p. 370.

Discusses established advantages of high temperatures for dyeing in package form. Suggest possibilities of piece dyeing for future exploration. Tables. 20 ref.

2707* Further Observations on the Effects of Evaporating Water From Cotton Cellulose. G. W. Madaras and H. A. Turner. *Society of Dyers and Colourists Journal*, v. 69, Oct. 1953, p. 371-377 + 1 plate.

Discusses experiments in the above. Suggests possible reasons for chemical modification of cellulose which took place. Diagrams, photographs, tables. 14 ref.

2708* Quality Control in the Cotton Industry. W. S. Sondhelm. *Textile Institute, Journal, Proceedings and Standarization*, v. 44, Oct. 1953, p. P717-P721.

Discusses functions of control. Indicates its importance in production of large quantities of goods of standard quality at minimum cost. 7 ref.

2709* Tentative Textile Standard No. 8. Method of Testing Water-Repellency of Cotton Fabrics Permeable to Air Using a Bundesmann Type Apparatus. G. E. Collins and J. Lord. *Textile Institute, Journal, Proceedings and Standarization*, v. 44, Oct. 1953, p. S50-S52.

Discusses results of interlaboratory trials.

2710* The Methylation of Cellulose With Diazomethane, and Some Properties of the Products. D. A. Smith. *Textile Institute, Journal, Transactions*, v. 44, Oct. 1953, p. T407-T419.

Describes comparative methylation of various types of cellulose. Reports that degree of methylation achieved with etherial diazomethane decreases with increasing crystallinity of cellulose material. Tables, photographs, graphs. 16 ref.

2711* Thermal Properties of Textile Materials. G. J. Morris. *Textile Institute, Journal, Transactions*, v. 44, Oct. 1953, p. T449-T476.

Factors contributing to thermal insulation, "cold feel", and "chillproofness" are discussed. Tables, graphs. 76 ref.

2712* Prevention of Soil Redeposition in Textile Cleaning Operations by Proteins and Other Polymeric Materials. W. Fong and H. P. Lundgren. *Textile Research Journal*, v. 23, Nov. 1953, p. 769-775.

Includes tables, graphs. 12 ref.

2713* Force Temperature Behavior of Nylon Filaments at Fixed Extensions. George M. Bryant. *Textile Research Journal*, v. 23, Nov. 1953, p. 788-792.

By use of thermodynamic equations for elasticity, force-temperature measurements on nylon filaments at fixed extensions in water have been related to the molecular mechanism of elasticity. Graphs, tables. 15 ref.

2714* The Effect of Draw Ratio and Temperature on Electrical Conduction in Nylon Filaments. E. P. Sharman, S. P. Hersh, and D. J. Montgomery. *Textile Research Journal*, v. 23, Nov. 1953, p. 793-798.

Includes graphs, tables. 7 ref.

2715* Generalized Creep Curves for Nylon. Ephraim Catsiff, Turner Alfrey, Jr., and M. T. O'Shaughnessy. *Textile Research Journal*, v. 23, Nov. 1953, p. 808-820.

Reports chief results of a study of the creep of a commercial sample of nylon 66 under constant tension at 36 C and several moisture conditions. Tables, graphs, diagrams. 12 ref.

THERMODYNAMICS

2716* Heat Transfer. James W. Hayward. *American Oil Chemists' Society, Journal*, v. 30, Nov. 1953, p. 557-561.

Reviews elementary concepts relative to design of heat transfer equipment. Graphs, tables, diagram. 22 ref.

2717 Heat Transfer by Conduction. Henry E. Robison. *Brick & Clay Record*, v. 123, Nov. 1953, p. 57, 59, 61, 63, 65.

Discusses effects of composition, particle size, and physical state on rates of heat release and thermal conductivity. Diagrams. 6 ref.

2718 Thermodynamics of the Acid Weston Cell and the Acid Clark Cell. Carl Wagner. *Electrochemical Society, Journal*, v. 100, Nov. 1953, p. 524-526.

The dependence of the potential of these cells is calculated thermodynamically and compared with experimental results. 12 ref.

2719* The Thermal Efficiency of Heat Exchangers With Consideration of Longitudinal Heat Conduction. (German.) H. W. Hahnemann. *Forschung auf dem Gebiete des Ingenieurwesens*, v. 19, Ausgabe B, no. 3, 1953, p. 81-87.

Discusses parameters used to compute highly efficient regenerators. Diagram, graph.

2720 A Rapid Method for the Determination of the Thermal Conductivity of Organic Liquids for Use in Heat-Transfer Calculations. S. Baxter, H. A. Vodden, and S. Davies. *Journal of Applied Chemistry*, v. 3, Oct. 1953, p. 477-480.

An apparatus of the concentric-cylinder type for determination of thermal conductivity of electrically insulating liquids is described. Results for a number of pure liquids are also presented and are compared with values obtained from the literature. Graphs. 7 ref.

2721* A Thermodynamic Study of Vapor Compression Heat Pump Cycles. J. L. Threlkeld. *Refrigerating Engineering*, v. 61, Nov. 1953, p. 1202-1206, 1268, 1270, 1272.

Analysis shows that Freon-11 yields highest theoretical efficiencies of existing refrigerants and that systems with at least two steps of condensation are desirable. 4 ref.

Thermodynamics

2722* "Cooling Potential" Versus "Specific Enthalpy". F. Rasori. *Refrigerating Engineering*, v. 61, Nov. 1953, p. 1207-1219, 1272.

Discusses heat transfer potential between moist air and water. Graphs, tables.

2723* Method of Supplying Energy for High-Temperature Endothermal Gas Reactions. (German.) E. Bartholomé. *Zeitschrift für Elektrochemie*, v. 57, no. 7, 1953, p. 497-502.

Discusses principles, advantages, and disadvantages of various methods of heating required to effect endothermal reactions. Graphs, diagrams.

See also:
1584 (TAS heat-transfer fluid)
1939 (heat transfer from electron tubes)

WELDING AND JOINING

2724 Testing Rubber Adhesives. W. H. Swire and A. Hardy. *Adhesives & Resins*. v. 1, Oct. 1953, p. 216-221.

Describes testing of adhesives for use in motor body building and in shoe manufacture. Photographs.

2725* Adhesive Joints. *Aircraft Production*, v. 15, Nov. 1953, p. 402-406.

Tests and structural applications of Reduxbonding process are described. Diagrams, photographs, graphs.

2726* Sheet-Metal Welding. II. Resistance-Welding in the Fabrication of Gas-Turbine Assemblies. *Aircraft Production*, v. 15, Nov. 1953, p. 420-429.

Describes resistance-welding equipment and techniques adapted in use of mechanical fixtures. Tables, diagrams, photographs.

2727 Universal Welder Reduces Welding Costs. *American Machinist*, v. 97, Nov. 9, 1953, p. 126-128.

Describes unit in which fixtures are eliminated by radial-arm head mounting arrangement, making submerged-melt welding practicable on low-activity assemblies. Photographs, diagrams.

2728* Point Shapes for Large Aluminium Rivets. D. A. Barlow and A. W. Brace. *Engineering*, v. 176, Oct. 23, 1953, p. 513-516.

Describes tests to determine optimum design in rivet-point shapes. Graphs, photographs, tables, diagrams. 6 ref.

2729* Welded Tubular Steel Factory Structure. *Engineers*, v. 196, Oct. 30, 1953, p. 570-572.

Describes structural frame of a factory which consists of a completely welded assembly of tubular steel columns and trusses Photographs, diagrams.

2730* The Electric Resistance Welding Process for Making Steel Tubes. J. S. Blair. *Institute of Welding, Transactions*, v. 16, Oct. 1953, p. 117-126.

Describes earlier methods and new process including equipment, plant layout, and operating procedures. Diagram, photographs.

2731 The Initiation of Brittle Fracture at Welded Joints in Steel Structures. W. G. Warren and H. G. Vaughan. *Institute of Welding, Transactions*, v. 16, Oct. 1953, p. 127-135.

Reports that under certain conditions fissured weld metal can precipitate brittle fracture in a weldment. Presents results of an investigation of factors involved in fissuring. Suggests means of its minimization. Photographs, tables, diagrams.

2732 Bimetallic Water Heaters Brazed for Strong, Tight Joints. Albert H. Trageser. *Iron Age*, v. 172, Nov. 5, 1953, p. 176-177.

Copper for corrosion resistance and steel for strength have been combined to produce hot-water heaters at moderate cost, yet with excellent serviceability. Diagram, photographs.

2733 Automatic Welding Cuts Costs of Fan and Blower Elements. *Machine and Tool Blue Book*, v. 49, Nov. 1953, p. 185-186, 188, 190, 192.

Describes equipment, application, and advantages. Photographs.

2734 Mechanical Fastening of Magnesium Assemblies. *Magnesium*, 1953, Nov., p. 1-6.

Describes procedures for assembly of parts by riveting, bolts and nuts, inserts, pins, dowels, keys, and other fasteners. Photographs.

2735 How to Control Carbide Precipitation in Welding Stainless Steels. G. E. Linnert and R. M. Larrimore, Jr. *Materials & Methods*, v. 38, Nov. 1953, p. 98-103.

Post annealing, use of special grades of steel, and proper welding technique are recommended as most satisfactory methods.

2736 The British Welding Research Association. K. Winterton. *Metallurgia*, v. 48, no. 288, Oct. 1953, p. 187-191.

Presents general report of progress in this field. Suggest projects for future work. Photographs.

2737* Sheet Metal Welded Joints. Fred Rogers. *Modern Machine Shop*, v. 26, Nov. 1953, p. 182-184, 186, 188.

Describes how machine designer can make it difficult or simple for welder as to type of welded joint specified. Diagrams.

2738 Properties of Preloaded Steel Bolts. W. C. Stewart. *Product Engineering*, v. 24, Nov. 1953, p. 191-195.

Discusses effects of applied torque, relaxation, preloading, and repeated impact loads. Diagrams, tables, graphs. 12 ref.

2739 An Unusual Application of Aluminium Flame Brazing. F. J. M. Smith. *Sheet Metal Industries*, v. 30, no. 319, Nov. 1953, p. 935-942.

Describes brazing of small-gage sheet. Diagrams, photographs.

2740 Welding Ultra-Thin Materials. *Sheet Metal Industries*, v. 30, no. 319, Nov. 1953, p. 967-968.

Describes gas-shielded arc welding of foils, using helium on the under side and argon on the top surface. Photographs.

2741 Pick the Right Arc Welding Method. Thomas H. Hruby. *Steel*, v. 133, Nov. 23, 1953, p. 84-87.

Compares welding by coated electrode, submerged arc, or inert-gas shielded arc methods. Photographs, table.

2742 Black-Up Flux: New Aid to Welding. Alvin L. Bennett. *Welding Engineer*, v. 38, Nov. 1953, p. 38-40.

Discusses problems, functions, techniques, and applications of fluxing. Photographs, diagrams.

2743 How to Weld 430 Stainless. Lester F. Spencer. *Welding Engineer*, v. 38, Nov. 1953, p. 42-46, 48.

Reports that ferritic stainless steels are acceptable substitutes in many instances for nickel-bearing austenitic stainless steels. Discusses corrosion and heat resistance; preheating and annealing; and welding techniques. Photographs, tables. 8 ref.

2744 Spot Welding of Titanium-Carbon Alloys. E. F. Holt, F. H. Vandenburgh, and N. L. McClymonds. *Welding Journal*, v. 32, Nov. 1953, p. 1057-1066.

Reports an investigation on spot welding of titanium-carbon alloys containing 0.1, 0.4 and 0.6% carbon in sheet thicknesses of 0.038-0.047 in. Includes surface preparation, physical properties, and welding conditions. Photographs, tables.

2745 The Human Element in Welding. Richard C. Wiley. *Welding Journal*, v. 32, Nov. 1953, p. 1066-1070.

Discusses present shortage of welding engineers. Suggests corrective measures including expanding public relations, using engineering personnel to more advantage, making in-service plant training count, and calling upon education to a greater extent. Photographs, diagrams.

2746 The Brazing of Titanium. N. A. DeCecco and John M. Parks. *Welding Journal*, v. 32, Nov. 1953, p. 1071-1081.

Describes methods of making brazed joints, development of fluxes, and preliminary investigations on recrystallization welding. Diagrams, micrographs, tables. 9 ref.

2747 Some Recent Advances in the Welding of Molybdenum. W. H. Kearns, H. B. Goodwin, E. Eichen, and D. C. Martin. *Welding Journal*, v. 32, Nov. 1953, p. 1082-1088.

To secure ductile welds, it is necessary that the faying surfaces of specially purified Mo be cleaned carefully and the welding

be done in high vacuum. Tables, micrographs, photographs. 20 ref.

2748 Welding for Low-Temperature Service. Robert W. Bennett. *Welding Journal,* v. 32, Nov. 1953, p. 1089-1097, 1099, 1101.

Deals with properties of various weld metals and base materials used in the fabrication of pressure vessels and heat exchangers for low-temperature service, and with certain tests used for their evaluation. Tables, graphs, micrographs.

2749 High-Speed Welding of Nonferrous Tubing. *Welding Journal,* v. 32, Nov. 1953, p. 1098-1099.

Describes mills for high speed conversion of coiled nonferrous strip into welded tubing. Photographs.

2750 ABC's of Pipe Cutting and Welding. D. A. Spaulding. *Welding Journal,* v. 32, Nov. 1953, p. 1100-1101.

Details procedures in oxy-acetylene cutting and welding. Photographs.

2751* Welded Fabrication Method Gives Time, Weight Savings on Giant Gear. Everett W. Sturdy. *Western Metals,* v. 11, Nov. 1953, p. 59-60.

Describes equipment and technique. Discusses saving in time and cost. Photographs.

2752 Argon-Arc Welding of Copper and Copper Alloys. Edwin Davis and E. A. Taylor. *Welding and Metal Fabrication,* v. 21, Nov. 1953, p. 418-423.

Reports results of welding trials. Photographs, tables. 4 ref.

2753 Gas or Arc Welding for Cast Iron? T. J. Palmer. *Welding and Metal Fabrication,* v. 21, Nov. 1953, p. 436-439.

Discusses preparation of casting, effect of heat on cast iron, preheating, and other factors to be considered in welding cast iron. Photographs, table. (To be continued.)

2754 The Self-Adjusting Arc—Improved Power Sources. J. C. Needham, W. G. Hull, and L. H. Orton. *Welding Research,* v. 7, Oct. 1953, p. 100r-102r.

Discusses mechanism of arc-length control in the self-adjusting arc, particularly the effect of output characteristics of the power source on degree of self-adjustment of arc lengths. Diagrams, graphs. 11 ref.

2755 Vanadium-Bearing High Tensile Weldable Steels. *Welding Research,* v. 7, Oct. 1953, p. 103r-107r.

Presents report of research work on possible replacement of Mo by V for high tensile steels. Tables, photographs. 2 ref.

2756 Weldability of Twelve Low-Alloy Steels Containing Vanadium. B. J. Bradstreet. *Welding Research,* v. 7, Oct. 1953, p. 107r-110r.

Reports experimental studies to determine susceptibility to hard-zone cracking. Tables, diagram, photograph. 3 ref.

2757 Triple-Projection Welding of Deep Drawing Mild-Steel Sheet. J. E. Roberts. *Welding Research,* v. 7, Oct. 1953, p. 111r-114r.

Discusses experimental studies including description of welding machine, materials, specimen type, and testing methods. Tables, diagrams, graph.

See also:
1808 (corrosion hazards from d.c. welding currents)
1922 (plating for soldering)
2204 (extending life of joints)
2211 (increased holding power of shrink fits)
2399 (resistance of welded beams to impact)
2569 (causes of welding quality variation)
2611 (adhesives for plastics)
2758 (resin glues for wood)
2768 (adhesives for paper)

WOOD AND FOREST PRODUCTS

2758 Heat Application in the Setting of Synthetic Resin Glues for Wood. H. A. Mills. *Adhesives & Resins,* v. 1, Oct. 1953, p. 211-215.

Discusses some practical considerations. Describes some new equipment now available for veneering and plywood manufacture. Photographs. (To be continued.)

2759 The Chromatographic Separation of Hardwood Extractive Components Giving Color Reactions With Phloroglucinol. R. A. Black, A. A. Rosen, and S. L. Adams. *American Chemical Society, Journal,* v. 75, Nov. 5, 1953, p. 5344-5350.

Four aromatic aldehydes giving phloroglucinol color reactions have been isolated in the ethanol extracts of oak hardwood.

2760* Description and Results of Field Tests Evaluating Fire-Retardant Coating Materials, Performed by the Atchison, Topeka and Santa Fe Railway System at Albuquerque, N. M. *American Railway Engineering Association, Bulletin,* v. 55, no. 510, Sept-Oct. 1953, p. 135-159.

Includes photographs, diagrams, tables, graphs.

2761* Investigation of Fatigue Strength of Railroad Timber Bridge Stringers. A Progress Report Covering Initial Work Done in Fatigue Testing of Full-Size Timber Bridge Stringers and Other Exploratory and Correlated Tests. J. L. Leggett, Jr. *American Railway Engineering Association, Bulletin,* v. 55, no. 510, Sept.-Oct. 1953, p. 161-211.

Includes tables, photographs, graphs, diagrams.

2762* Advance Report of Committee 7—Wood Bridges and Trestles Static and Fatigue Strength of Timber Joints. *American Railway Engineering Association, Bulletin,* v. 55, no. 510, Sept.-Oct. 1953, p. 213-221.

Describes progress regarding test methods of the above. Photographs, graphs.

2763* The Anatomy of the Timbers of the South-West Pacific Area. III. Myrtaceae. H. D. Ingle and H. E. Dadswell. *Australian Journal of Botany,* v. 1, Sept. 1953, p. 353-401 + 10 plates.

Based on examination of all available species, anatomical features of each genus have been summarized. Results are set out in tabular form. Tables, graphs, diagram. 30 ref.

2764* Sectional Paper Machine Drive With Electronic Control. *Engineer,* v. 196, Oct. 30, 1953, p. 565-568.

Describes equipment and its operation. Photographs, diagrams, tables.

2765* The Laboratory Control of Pulp and Paper Manufacture. Julius Grant. *Laboratory Practice,* v. 2, Nov. 1953, p. 593-597.

Briefly discusses cellulose pulp manufacture and tests for evaluating fibrous raw materials. Tables.

2766* New Mead Pulp Making Facilities Adds to Soda Pulp Production. *Paper Mill News,* v. 76, Nov. 14, 1953, p. 54, 56, 58, 60, 62.

Describes new plant at Chillicothe, O. Includes instrumentation, wood preparation, digesters, and recovery system.

2767* Some Economics Aspects of Paper and Paper Board Converting Industry. Henry J. Perry. *Paper Trade Journal,* v. 137, Nov. 13, 1953, p. 101-105.

Includes graphs.

2768* Adhesives for Paper. R. T. Elias. *Paper Trade Journal,* v. 137, Nov. 13, 1953, p. 116-120.

Gelatine glue, casein, soya, and starch vs. silicate solutions and emulsions, as well as non-aqueous solutions of the lacquer-type are discussed.

2769* Fabrication of Corrugated Shipping Containers. Norman W. Garrison, Jr. *Paper Trade Journal,* v. 137, Nov. 13, 1953, p. 137-142.

Article centers around type of operations performed at the plant of the Eddy Paper Corp. Photographs.

2770* Fabrication of Solid Fibre Containers. Norman W. Garrison, Jr. *Paper Trade Journal,* v. 137, Nov. 13, 1953, p. 143-146.

Discusses fabrication of solid fibre containers. Tables, photographs.

Wood and Forest Products

2771* Folding Cartons. William D. Hall. *Paper Trade Journal*, v. 137, Nov. 13, 1953, p. 147-159.
Presents challenging facts and information on folding cartons—the end product of a large segment of the vast paper converting industries. Photographs, diagrams, tables.

2772* Fibre Drums. Glenn Mather. *Paper Trade Journal*, v. 137, Nov. 13, 1953, p. 166-168, 170-172, 174.
History and growth of fibre drum industry; general characteristics and principal raw material used in manufacture; and manufacturing data are covered. Photograph, table.

2773* Molded Pulp Products. W. E. Parsons. *Paper Trade Journal*, v. 137, Nov. 13, 1953, p. 175-180.
Presents in a general way the picture of the molded pulp process. Photographs, diagrams.

2774* Twisted Paper Products. T. M. Sellers. *Paper Trade Journal*, v. 137, Nov. 13, 1953, p. 190-192, 195-196.
History of twisted paper fabrics and methods of manufacture. Photographs. 6 ref.

2775* Converting of Parchment and Greaseproof Papers. Marshall Rutz. *Paper Trade Journal*, v. 137, Nov. 13, 1953, p. 201-203.
Covers conversion and testing of grease-proof paper and vegetable parchment.

2776* Asphalt Saturated and Laminated Paperboard. Roman J. Suess and Roger E. McVickar. *Paper Trade Journal*, v. 137, Nov. 13, 1953, p. 262, 264-266.
Discusses manufacture and common uses. Diagrams.

2777* Paper and Paperboard Products for Military Use. E. T. A. Coughlin. *Paper Trade Journal*, v. 137, Nov. 13, 1953, p. 267-272.

2778* Specialty Impregnation. Ralph T. Nazzaro. *Paper Trade Journal*, v. 137, Nov. 13, 1953, p. 273-279.
Covers paper products manufactured by specialty impregnation; their limitations and successes; and their future. Tables, graphs.

2779* Some Answers to Problems in Handling Stock Flow to Forming Elements. Allen A. Lowe. *Paper Trade Journal*, v. 137, Nov. 20, 1953, p. 14-18.
Includes photographs, diagrams.

2780* How New Bleaching Plant Was Built by Gaspesia. *Paper Trade Journal*, v. 137, Nov. 20, 1953, p. 20-23.
Describes a new plant incorporating latest advances in pulp bleaching. Photographs.

2781* The Ross-Hooper Enclosed-Type Paper Machine Hood. G. J. Chalmers. *Southern Pulp and Paper Manufacturer*, v. 16, Nov. 10, 1953, p. 58, 60-64, 66.
Describes design and development of hood and exhaust system. Photographs, diagrams.

2782* Paperboard Drying Investigation by Means of an Experimental Drying Machine. Stanley F. Smith and B. W. Attwood. *Tappi*, v. 36, Nov. 1953, p. 481-490.
Discusses machine which subjects pieces of moist paper or paper board to a drying process closely simulating that taking place on the cylinders of a paper or board machine drier section. Photographs, tables, graphs, diagram. 8 ref.

2783* The Deculator on a Kraft Paper Machine. A. W. Duskin and W. B. Jenkins. *Tappi*, v. 36, Nov. 1953, p. 490-492.
Describes advantages of increased production, elimination of foaming problem, and improvements in paper quality resulting from deaeration of stock by means of the Deculator. Diagram, graphs.

2784* Density, Viscosity, Specific Heat, Thermal Conductivity, and Prandtl Number Versus Concentration and Temperature. III. Sulphite Waste Liquor. R. E. Hunter, John Tracy, R. Cutts, R. E. Young, J. Olin, and Joseph L. McCarthy. *Tappi*, v. 36, Nov. 1953, p. 493-497.
Optimum values are suggested for use in engineering calculations. Examples are given showing applications of data to design of fluid flow and heat transfer equipment. Graphs, table. 26 ref.

2785* Dye Adsorption on Wood Pulp. III. Effect of Pulp Processing on Specific Adsorption. E. F. Thode, A. J. Chase, S. S. Majmudar, and D. R. MacKinnon. *Tappi*, v. 36, Nov. 1953, p. 498-504.
Reports that changes in specific dye adsorption are related to changes in physical properties of a chemical pulp during course of heating. Graphs, tables. 9 ref.

2786* Filtration Through Paper. Robert Ingalls and Oliver Axtell. *Tappi*, v. 36, Nov. 1953, p. 509-512.
Effect of beating time of stock upon filtration efficiency of the sheet was investigated for hardwood soda pulp. Graphs, table.

2787* Evaluation of Refiner-Plate Designs Used for Experimental Processing of Hardboard Stocks. H. Dale Turner. *Tappi*, v. 36, Nov. 1953, p. 513-517.
Effects of dissimilar plate designs used in a disk refiner for processing hardboard pulp upon stock drainage time, board strength, and energy consumed in milling the stock were investigated by means of a 5-hp. single-rotating-disk attrition mill. Photographs, table, diagram, graphs. 12 ref.

2788* A Study of the Reaction Products of Lignin Model Compounds and Sodium Hydrosulphide. Thomas G. Zentner. *Tappi*, v. 36, Nov. 1953, p. 517-523.
Includes tables. 9 ref.

2789* Thermal Conductivity of Paper Honeycomb Cores and Sound Adsorption of Sandwich Panels. D. J. Fahey, M. E. Dunlap, and R. J. Seidl. *Tappi*, v. 36, Nov. 1953, p. 523-528.
Presents results of research work on improving thermal insulation and sound adsorption. Tables, photographs. 5 ref.

2790* Progress in Alkaline Pulping—1952. J. E. Stone and S. D. Wells. *Tappi*, v. 36, Nov. 1953, p. 38a, 40a, 42a, 44a, 46a, 48a, 50a, 52a, 56a, 58a, 60a, 62a.
Presents a general review of literature. Includes expansion in the industry, pulping of various plant materials, liquor make-up and pulping variables, problems associated with black liquor recovery, odor abatement, stream pollution, and certain aspects of stock preparation. 215 ref.

2791* Chemical Heterogeneity of Pine and Fir Wood Cellulose in the Trunk. (Russian.) V. I. Sharkov, V. A. Efimov, V. S. Muromtsevo, and A. V. Tsalikova. *Zhurnal Prikladnoi Khimii*, v. 26, no. 6, June 1953, p. 626-639.
Discusses variations in cellulose properties of samples taken from various parts of the trunk. Tables, graphs. 6 ref.

See also:
1872 (electronic controlled papermaking machine)
1883 (paper in manufacture of electrical equipment)
2418 (wood dies)

CONDUCTION COUNTER NEEDLE

The "eye" in this close-up view of a hypodermic needle is a minute but sensitive cadmium sulfide crystal. The "eye" is a conduction counter, sensitive to beta particles. Nestled in the needle's hollow point, the crystal can be brought easily into contact with the blood of living subjects of medical research. After beta-radioactive tracer material has been injected into the blood stream, the crystal is used to detect and trace its course through the body. This needle-probe, as developed by Battelle technologists, provides medical research with a novel and useful tool.

BATTELLE INSTITUTE was founded by the will of Gordon Battelle as a memorial to the Battelle family. The Battelles were among the first settlers of Ohio and were prominent in the development of the state's iron and steel industry.

Gordon Battelle, last of the family line, was impressed with the benefits to be derived from industrial research and left his estate for the building and endowment of an Institute "for the purpose of education . . . the encouragement of research . . . and the making of discoveries and inventions for industry." The Institute began operations in 1929.

As established, Battelle provides, on a not-for-profit basis, the physical plant, equipment, and personnel for conducting research. The great bulk of it is applied research conducted for industry and government.

In keeping with its educational function, the Institute also conducts fundamental or basic research. The results of much of this research are published for the general encouragement of science and industry, and to benefit the public welfare.

Fields of research at Battelle include agriculture and practically all the industrial and engineering sciences.

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